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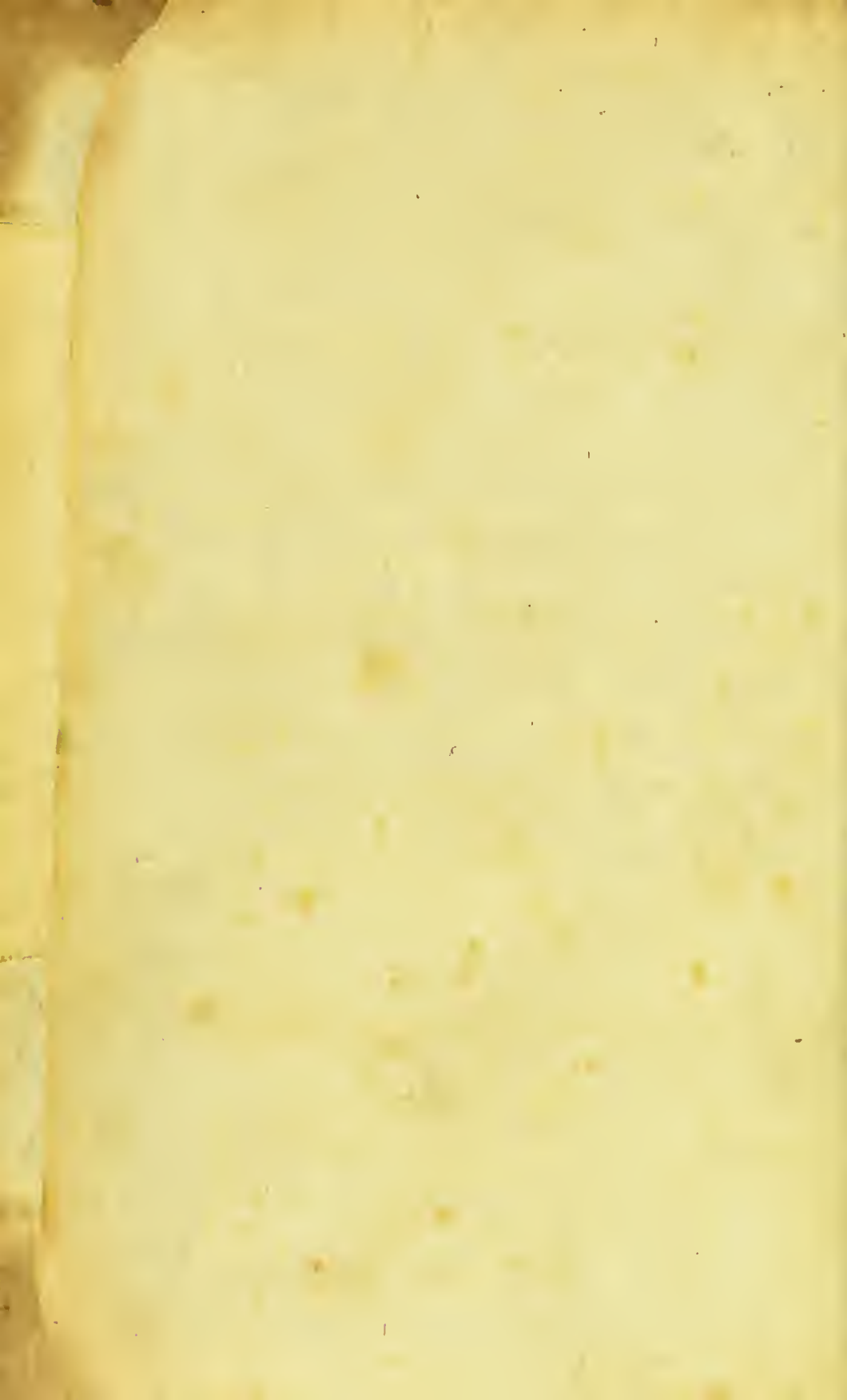
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A
PRACTICAL ESSAY
ON
DISEASES OF THE VISCERA;
PARTICULARLY THOSE OF THE
STOMACH AND BOWELS,
THE
LIVER, SPLEEN, and URINARY BLADDER:

IN WHICH THEIR
NATURE, TREATMENT, AND CURE,
ARE CLEARLY POINTED OUT AND EXPLAINED.

By JOHN LEAKE, M. D.

Member of the ROYAL COLLEGE⁷⁰ of PHYSICIANS, LONDON,
and Physician to the Westminster Lying-in Hospital;
at his House in Parliament-Street.



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ABSTRACT

ABSTRACT ACCOUNT
OF THE
WESTMINSTER LYING-IN HOSPITAL,
NEAR THE BRIDGE,

Instituted A. D. 1765, and supported by Voluntary Subscription.

Right. Hon. Earl GROSVENOR, President.

Duke of Rutland,	} Vice-	Rt. Hon. C. J. Fox,	
Adm. Lord Hood,		Presi-	Maj. Gen. Sir R. Boyd,
Hon. Gen. W. Hervey,		dents.	Hon. T. Grosvenor.

IN the year 1765, Dr. *John Leake*, of Parliament-Street, London, purchased a piece of Ground on a Building-Lease, and afterwards presented to the Public the *Original Plan for the Institution of this Hospital*. Soon after the Building was raised, he voluntarily, and without any consideration, assigned over to the Governors all his right of the above Ground, in favour of the said Hospital.

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The Institution of this Hospital, was principally designed to relieve the *Wives of distressed Housekeepers*, or those of *poor, industrious Tradesmen*,
a
who

who from unavoidable misfortunes, or the expence of maintaining large families, were *reduced to real want*; also, for those of *Solaiers and Sailors*.— But the Governors moved with compassion at the many severe hardships of *Single Women*, who, on that account, were rejected elsewhere; they unanimously resolved to admit such of them as are deserted and in deep distress; with the humane intention of saving them from *Despair*, and preventing the lamentable Crimes of *Suicide*, and *Child-Murder*!

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Physicians, { Dr. *John Leake*,
&c. to the { Dr. *James Ford*, Physician to the Queen's
Hospital. { Dr. *Richard Huck-Saunders*.

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The Seventh Edition of

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TOWARDS THE

PREVENTION AND CURE

OF

CHRONIC DISEASES

PECULIAR TO

W O M E N:

In which their Nature is explained, and their Treatment
clearly laid down, *divested of the Terms of Art*, for the
Use of those affected with such Diseases, as well as
the *Medical Reader*.

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Prescriptions, or efficacious Forms of Medicine, in
English, adapted to the several Diseases.

By JOHN LEAKE, M.D.

Member of the ROYAL COLLEGE of PHYSICIANS, LONDON, and
Physician to the Westminster Lying-in Hospital.

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when irregular, obstructed, or redundant.*

SECT. III. *Cessation of Periodical Discharge in the Decline of Life, and Disorders arising from that critical Change of Constitution.*

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Diseases of the Womb, their Treatment and Cure.

SECT. IV. *Fluor Albus, or Female Weakness, how distinguished from Venereal Infection, and the Methods of its Cure.*

SECT. V. *Of Scirrhus, Cancer, and Ulceration of the Uterus.*

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SECT. VIII. *Of Hæmorrhoids or Piles; Obstruction, or Incontinence of Urine, Strangury, and Ulceration of the Bladder.*

C H A P. III.

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SECT. X. *Of Nervous Disorders, Hysteric Affections, Low Spirits, and Melancholy; their Treatment and Cure.*

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C H A P. IV.

SECT. XIII. *Diseases of the Skin and Glands; or cancerous Affections of the Face, Neck, or Breasts.*

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Instructions for those who consult a Physician by Letter.

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VOL. II.
PRACTICAL OBSERVATIONS
ON THE
CHILD-BED FEVER,
AND
ACUTE DISEASES
IN GENERAL MOST FATAL TO
WOMEN
DURING THE
STATE OF PREGNANCY.

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INTRODUCTION.

- SECT. I. *History of Child-bed Fever deduced from the Symptoms of that Disease, taken from the living Body, and Examination of its morbid Appearances after Death.*
- SECT. II. *Practical Observations and Inferences arising from the History of this Disease, with the Methods most conducive to its Cure.*
- SECT. III. *Of the Prophylactic Method, or Means contributing to prevent the Disease.*
- SECT. IV. *History and Treatment of Child-bed Fever further illustrated by Cases, with Practical Remarks on the whole. Also occasional Animadversions on the Section of the Symphysis Pubis, as a Substitute for the Cæsarian Operation.*
- SECT. V. *Of the Nature and Treatment of Uterine Hemorrhages, before and after Delivery; and the new Method of Practice recommended by the Author.*
- SECT. VI. *Of Convulsions, and Acute Diseases in general, most fatal to Women during the State of Pregnancy; viz. Pleurisy, Dysentery, and Small Pox; with their Nature, Treatment, and Method of Cure.*

By

By the following Letter, with which the Author was honoured, A. D. 1775, it appears that his Practical Observations, &c. have been translated into French; they have also been translated into the German and other languages.

Monfieur Monfieur *John Leake*, docteur en médecine, membre du college royal des médecins de Londres, &c.

M Aximâ cum voluptate et non sine fructu, Vir illustrissime et ornatissime, tuum legi et relegi librum, cui titulus est: *Practical Observations on the Child-bed Fever, printed London 1772.* In illo enim reperi animadversiones curiosas et plane novas de affectibus omenti, disquisitiones nitidas, et sagaces, de curatione febris puerperium insequentis, dubitationes quas dictarunt prudentia et moderatio, contra systema nostri Celeberrimi *Leuret*, cogitationes accuratas de hæmorrhagiis ante, et post partum. Quid magis? in toto iudicium et scientia veri bonique medici-refulget. His itaque perpensis, seu ægrorum salutem, seu artis medicæ incrementum prospiciam, tuum librum cunctis gratissimum duxi; quapropter ut melius innotescat, hunc in idioma gallicum converto, jam ferme absoluta est interpretatio; et paucos intra menses, si tibi libet, prelo publico poterit in Francia committi.

Mihi familiaris et colendus amicus habet nunc sub prelo tractatum idiomate Gallico scriptum de hæmorrhagiis uterinis. Plurimis abhinc mensibus auctori communicaveram versionem tuæ sectionis V. æ. *Of the nature and cause of Uterine Hemorrhages, and their treatment, &c.* in hoc novo tractatu mei amici, multa sunt de te excerpta cum laude tui ingenii et tui operis.

Auctor novi tractatus, post expositionem variarum methodorum contra hæmorrhagias uteri, nil efficacius invenit quam obturatio vaginæ cum Linteolis vel siccis, vel imbutis aceto, sed profunde immisissis. Hæc methodus olim vetustissimis nota, in oblivione quodammodo jacebat; sed nunc resurgit longa et felici experientia stabilita; et enim introductio linteorum in vagina dum sistit sanguinis fluxum juvat quoque formationem coaguli; interim uterus novas acquirit vires; sese conglomerat et constringit, contractionibusque propellet coagulatum sanguinem et linteola immissa; sed ut obturamentum vaginæ sit semper faustum, plurimæ sunt adhibendæ cautiones: scilicet,

cet, mollis compressio uteri cum manu, applicatio supra pubem linteorum aqua frigida, aut forsan melius aceto madidorum, usus aëris frigidi, et, ut uno dicam verbo, quidquid potest juvare uteri contractiones. et vasorum sanguinem fundentium clausuram.

Celeberrimus *Hoffman*, *Cornelius Trioen*, multique alii jam indicarant obturamentum vaginæ contra hæmorrhagias uteri; hæc methodus tibi, Vir clarissime, non erat ignota; attamen in praxi vix erat explorata. In curriculo mensis proximi, ut opinor, novus tractatus mei amici evulgabitur; et in illo videre poteris ferme omnia quæ scripsisti de opio, medicamentis astringentibus, venæ sectione, &c.

Vale, Vir clarissime; et quanquam sim extraneus, et nullo modo tibi notus, non dedigneris, quæso, meam sinceram admirationem.

FRANCISCUS CHAUSSIER.

Datum Divione die 21. 7bris. 1775.

Chirurgiæ magister in urbe Divionensi apud Burgundos, acad. reg. chirurgiæ Parisiensis correspondens, &c.

P. S. Si velis mihi responsum dare, subjungo inscriptionem epistolæ in idiomate gallico.

A Monsieur Monsieur Chaussier, Maître en Chirurgie, &c. à Dyon.

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By JOHN LEAKE, M.D.

* * * The advertised Compounds, named *Lisbon Diet-Drink* and *Leake's Pills*, &c. are unknown to the Author.

††† Dr. Leake's hours for advice, at his House in *Parliament-Street*, are from ten to twelve in the Morning.

A
PRACTICAL ESSAY
ON
DISEASES
OF THE
ABDOMINAL VISCERA, &c.

SECTION I.

Of the general functions of the STOMACH, and natural qualities of SALIVA, BILE, and PANCREATIC JUICE subordinate to its use; and of the Disorders proceeding from depravity, redundancy, or defect of those fluids.

NO Diseases incident to the human body are more frequent than those of the *Stomach and Bowels*, or more fatal in their event when neglected or improperly treated; for, then they frequently terminate in obstinate or incurable maladies of the *chronic kind*; and,

B

on

2 GENERAL FUNCTIONS OF THE STOMACH,

on the contrary, there are few diseases, whether acute or chronic, which do not, in some degree, affect the *Stomach and Viscera*.

A GENERAL knowledge of those *vital parts*, and their use in the animal œconomy, is highly necessary towards a more clear and distinct idea of their several diseases, and the means by which they may be relieved or cured; but, as their intimate connexion and mutual sympathy are such, that it would be difficult to understand the morbid affection of any single part without relation to the whole; the following Essay, however imperfect, is not confined to what is usually understood by the *stomach and alimentary tube*, but is intended also to comprehend Diseases in general incident to the *abdominal viscera*; namely, those of the *Liver*, commonly called *bilious*; those of the *Spleen* and *Pancreas*, hitherto but little attended to; and those of the *Kidneys, Bladder*, and urinary passage, under the denomination of *gravel and stone*, or other local affections of those parts; together with the *Hæmorrhoids or Piles*.

To

To the whole is added a SUPPLEMENT containing observations on the *influence of the Passions* on the body and mind; and *the salutary power of Air, Diet, and Exercise*; inasmuch as the last contribute more to promote *Digestion*, and remove *Diseases of the Viscera*, even than medicines themselves; or at least, without their aid, other remedies would often prove ineffectual.

BEFORE we examine the nature of *animal Digestion*, or the treatment of disorders arising from its defect, it is necessary to consider the qualities of two fluids which principally contribute thereunto, namely, *Saliva* and *Bile*; for, as the first of those creates appetite, and helps to dissolve the food; so, *bile* in the alimentary tube, diluted by *pancreatic juice*, is conducive to the same end, in perfecting digestion; consequently, the depravity, deficiency, or redundancy of those fluids, by impairing the faculties of the stomach and hindering digestion, will lay the foundation of various diseases.

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THE *saliva* is a penetrating, soapy fluid prepared by the glands of the mouth, as the proper solvent which nature employs to soften and macerate aliment in the stomach, the better to assist digestion, as well as to create appetite; for, it has been observed, that *those who discharge it profusely, by frequent spitting, have a weak appetite and bad digestion.*

AFTER long abstinence from food, the *Saliva* becomes so rancid and tenaceous, that it will extinguish *quicksilver*, in the same manner as unctuous substances; and, in scorbutic habits, where the blood is much vitiated, it is rendered putrid. By changing its nature it becomes extremely hurtful, and may be converted into a *mortal poison*, of which, we have the most striking and melancholy instance in the bite of a *mad dog*, where the venom is lodged in the *saliva*.

THE health of *Monastics* who rigorously enjoin themselves the penance of *long-fasting*, suffers much on that account. They are observed to have an offensive breath, attended with
looseness

looseness of teeth, sickness at stomach, and giddiness in the head. Those effects manifestly proceed from a partial corruption of the animal fluids; and from the same cause, the milk of nurses, after long fasting, is rendered salt and nauseous to the infant; insomuch that it may from thence be thrown into a diarrhoea or convulsions. The urine is also rendered high coloured and foetid, sometimes creating stranguary, or difficulty of making water.

THOSE disagreeable symptoms are occasioned by the *sharp salts* and *rancid oils* which naturally are carried off by urine; but when too long retained, powerfully dispose the juices to a state of putrefaction. That the kidneys are the proper organs, by which this *briny acrimony* is naturally discharged, appears manifest from the saltness of urine; and because particular salts, as those of *nitre*, *sea-salt*, &c. when dissolved and taken into the blood, may be obtained from the urine by chemical process, and are *identified* by shooting into the *same crystalline form* as those which had been dissolved and received into the stomach.

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ANIMALS, therefore, which *die of hunger*, seem rather to perish by a corruption of the blood, or morbid change of its quality, than from a diminution of its quantity; for, in deep consumptions, where the wasting of body is much greater than in those who die of hunger, the patient sustains life for many months, though apparently exhausted.

HENCE, a circumstance, though strange, becomes perfectly consistent and intelligible, viz. why animals will so long survive, even *twenty days* or more, by the use of *water only*; for, this fluid refreshes and purifies the blood, by dissolving its sharp salts, which, with the corrupted oils, being conveyed off by urine, the body is preserved from their pernicious and corroding qualities.

A REMARKABLE and well-authenticated example of this kind, happened, Nov. 13, 1788, to a girl who lived *eighteen days* on a barren moor, near Stronaway, in the Island of Lewis, without any other subsistence but *water*: The
history

history of her case was drawn up by Mr. John Miller surgeon of that place, and is inserted in the fourth volume of the second Decade of Dr. Duncan's Medical Commentary, for the year 1789.

It has been observed, by the assistance of a microscope, that the pale fluid circulating in the transparent vessels of a languid frog, soon acquires a more florid colour and brisker motion, after that reptile has been supplied with its proper nourishment. This experiment evidently shews the great advantage of eating often and in small quantities; a caution of much more consequence to those of weak stomachs than is generally imagined; for, by long fasting, they often become faint with sickness at stomach and universal languor; not only from want of circulating power in the blood, and its tendency to putrefaction, but also from its emptiness, or excessive collapsion. When the stomach is moderately full, it uniformly sustains or bolsters up the *Liver and Spleen*; but when empty, the liver descends by its

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own weight, and, pulling down the diaphragm, with which it is connected, excites a painful, sickly sensation, which in some degree may be removed by gentle pressure on the abdomen, but more effectually by replenishing the stomach with food.

FROM this circumstance also may be inferred, that the vast recruit of strength after eating is owing to the introduction of fresh chyle into the system, and that an animal body, like a vegetable, cannot long survive with vigour, without the reficient power of new juices to supply the loss of those which were wasted and carried off by the action of the body; for, as oil is the *pabulum* of flame, so that vital fluid, *blood*, in purity and due quantity, is indispensibly necessary to feed the lamp of life; and this chiefly depends upon the *digestive faculty of the Stomach* rather than the quantity or quality of its aliment, since daily observation informs us, that plenty of the most nutritive aliment will be insufficient to sustain the infirm, whilst those of strong constitutions and
good

good digestion will gain strength, though living sparingly upon the hardest fare.

HENCE also may be seen the great advantage of taking fluid, acescent nourishment often, with a view to preserve the blood in a state of purity, especially in *scorbutic* or *consumptive* habits, where it evidently tends to putrefaction.

FROM the irritation of *saliva* on the spongy, *nervous lining* of the stomach, seems principally to arise that sensation we call *hunger*; but, when this delicate membrane is shrunk up and destroyed by the immoderate use of *spirituous liquors*, or the no less pernicious effects of *harsh, astringent medicines*; loss of appetite will necessarily follow, which never can be restored.

THUS, it will also appear how both *Appetite and Digestion*, may vary according to the different quantity and quality of the *Saliva*; as well as the different degree of natural feeling in the nervous coat of the stomach; and why *bitters, steel, and mineral acids*, may quicken a languid appetite, for a time, although their
long-

10 GENERAL FUNCTIONS OF THE STOMACH,

long continued use will afterwards *destroy* it. Also, why oily food, which blunts the acrimony of *saliva*, and relaxes the stomach, will relieve that excessive hunger or preternatural craving for food, called *canine appetite*.

THE wonderful influence of the *Stomach and Bowels*, in subduing and changing the property of alimentary substances, still appears more evident, by observing that some poisons may be divested of their malignant power when swallowed, which, applied to the open vessels of an ulcer or fresh wound, would suddenly have proved mortal.

THE German mountebank, who caused an enraged *Viper* to bite a piece of bread, which he eat before the multitude, seems to have been acquainted with this circumstance; for, after being apparently taken ill, and mimicking convulsions, with other grievous effects of the poison, he had recourse to a dose of his *antidote*, and, in consequence of its pretended efficacy, suddenly recovered.

WE are next to consider the properties of *Bile*, an animal soap of a yellowish colour and prepared in the *Liver*, as by a large gland, to incorporate and combine the *oily and watery parts of our food*, so as to form a smooth emulsion or nutritious fluid called *chyle*, which could not, otherwise, have been so well effected; for, oil and water repel each other and will not mix without the interposition of *lixivial salt*, which, by the power of heat, forms that concrete called *soap*.

THAT *Bile* possesses a soapy quality is evident, by its use among fullers and silk-dyers, who employ it with success in discharging oily spots or stains. It is also endowed with so strong a dissolving power, that curdled milk in the stomach of a calf, is thence rendered fluid as soon as it passes into the *small guts*, which seem to answer the purposes of a second stomach. This saponaceous fluid may therefore be considered as a *liquid soap* and *natural purgative* which stimulates the bowels, and quickens their motion in expelling the fœces or grosser part of our food.

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It may be proper to observe, that as *want of saliva lessens Appetite and impairs Digestion, so the bad qualities, redundance, or defect of bile, produce various disorders of the stomach and bowels, and render the body preternaturally costive or laxative.* Where the *bile* is rancid, and corrupted, or abounds too much, it occasions sickness at *stomach* and vomiting, head-ache, colic pains, and *diarrhæa*, with stools of a deep yellow colour; but they are green, porraceous, and frothy, where *redundant acid prevails.*

WHETHER *Bile* offends in *quantity* or *quality*, nothing will so much correct it as plentiful dilution, and the liberal use of *vegetable acids*; since these two fluids have been experimentally found to *neutralize* or destroy each other.

IN such cases, the patient should totally abstain from fermented liquors; (rough cider, rhenish wine, or old hock excepted.) Spare vegetable diet of the *ascendent kind*, and the plentiful use of pure water, with lemon or orange juice, will afford relief; but a *solution of crystals of tartar* in pure water, with currant jelly which
will

will impart to it a saponaceous quality, is preferable to all the rest: It not only resists putrefaction, and promotes the secretion of urine, but also keeps the body gently laxative.

WHEN *bile* is deficient in quantity, or too mild and inactive, or so thick and tenaceous as to obstruct its canals; habitual *costiveness* will follow; and if such depravities, to which those of a sedentary life are most subject, be not removed by proper medicines; *gall-stones* will often be formed in the gall-bladder, or its duct; from which, obstruction of the *liver*, a jaundice, dropsy, or other *chronic diseases*, are frequently the consequence.

THE gall of animals, particularly that of the eel and pike, pills compounded of *soap* and *aloes*, with fresh whey, and nitre, or a small portion of alkaline salt, and exercise on horseback, will exalt and attenuate the *bile*, and render it more active and deterfive.

THAT the *Bile* is a fluid of great use in the animal œconomy, is manifest, seeing, that for
its

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its præparation, nature has appointed so large and complicated an organ as the *Liver*.

THE *Pancreas* is a large gland, similar in structure to those which secrete the saliva, of a flattish, oblong form, and extends across the abdomen, behind the stomach, liver and spleen. By its blood-vessels it communicates with the *spleen* and *mesentery*; and, by its nerves, with the stomach and liver.

THE *Bile*, especially that proceeding from the gall-bladder, is somewhat glutinous, in so much that, although it is a saponaceous fluid, it requires dilution, to make it mix more readily with the *chyle*, as well as to attenuate and render that nutritious emulsion thinner and more fit to enter the *lacteals*.

For this purpose, the *pancreatic juice* is plainly intended; because, in quality and consistence, it exactly resembles *saliva*, and seems to answer the same purpose in the alimentary tube as saliva in the stomach, viz. farther to macerate the aliment, to exalt the nature of chyle, and render it less heterogeneous and dissimilar

diffimilar to the blood, after being thus diluted and incorporated with a fine animal lymph strained off from the blood itself.

THAT the pancreatic juice should also more effectually mix with and dilute the bile; its excretory duct unites with that of the last fluid, and, forming one common canal, empties itself into that part of the alimentary tube nearest the stomach, called *duodenum*.

FROM the magnitude of the *Pancreas*, the quantity of its secreted juice must be very considerable; and, if it is affected by the exhibition of *mercury*, in the same manner as the *saliva glands*, to which it is similar in structure; it can then be no wonder, that the waste of that fine, nutritious fluid, by a *mercurial salivation*, should exhaust the body and occasion an *incurable consumption*.

THERE is reason to think, that many *chronic complaints of the abdominal viscera*, hitherto little attended to, or mistaken for diseases of the stomach, may originate from a *diseased state of the Pancreas*. Like other glands, it is subject to
obstruction,

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obstruction, inflammation, tumor, abscess, and even calculous concretions; it must also be obvious, that such morbid affections will occasion disorders peculiar to the situation and connexion of this part, viz. *a sense of weight and oppression near the region of the stomach*, colic pains, or other symptoms of an obscure and complicated nature.

THIS conjecture is confirmed by the history of several cases in ancient writers, where, after dissection the *Pancreas* was found *schirrous*, or *cancerous*, and sometimes enormously enlarged, or corrupted and destroyed.

As the *pancreatic juice* is necessary for the dilution of chyle, towards its free passage through the lacteal vessels into the blood, without which the animal system could not be nourished or sustained; it will follow that its defect, or preternatural tenacity, will produce *obstructions of the lymphatic vessels*, and *mesenteric glands*, and occasion that particular species of consumption or wasting of the body, called *marasmus*.

S E C T.

S E C T. II.

Of ANIMAL DIGESTION, or the conversion of aliment into nourishment or chyle; and of NUTRITION, or the change of chyle into blood.

HAVING pointed out the qualities of *Saliva*, *Bile*, and *Pancreatic Juice*, as subservient to the office of the *stomach* and *bowels*; and also the general disorders arising from a vitiated state of these fluids; we shall now consider the nature of *Animal Digestion*, and the various diseases of the *viscera*, proceeding from a defect of that extraordinary faculty.

THE *stomach* is the great source from which the animal body derives its nourishment and support. Here the first process of preparing that *vital fluid*, called *blood*, is begun; and as its digestive faculty is duly or imperfectly exerted on the aliment, so the blood will be rich, balmy, and pure; or crude, watery, and depraved; the first of these qualities will

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contribute to health, the last will render it unfit for circulation and the purposes of life; and, consequently, lay the foundation of various diseases.

THE stomach may be considered as a vessel, or *Refectory* placed in the center of the body, for concocting and digesting the food, daily taken into it for sustenance. By the action of mastication or chewing, the aliment is comminuted or broken down, and, by mixing with the *saliva*, is macerated and reduced into a pulp: Thus prepared, it descends into the stomach, where, assisted by heat, and a supply of *gastric juice* similar to the *saliva*, it is supposed to undergo a slight degree of *fermentation*, by which the included air is rarefied and expanded; and bursting from its confinement, destroys the solid, compact texture of the aliment, rendering it one degree fitter for nourishment.

THIS will be more easily effected, as all animal and vegetable substances lose their cohesion, and naturally tend to dissolution, so soon

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as circulation through their vessels ceases, and when thus deprived of their contained air, which has been experimentally found to be the very *vinculum*, or bond of union which holds their parts together.

THE mass being sufficiently digested, is expelled from the stomach into the alimentary tube proceeding from it, where, its most nutritious parts, like a fine emulsion, which is called *chyle*, are strained off and absorbed by the *laëteals* or milky vessels, and discharged into the *receptacle of chyle*; whence, by the *thoracic duct*, it is conveyed into the blood, and, by agitation in the *Lungs*, and repeated circulations with the general mass, at last acquires the same colour, quality, and consistence, as that fluid; or, in other words, is elaborated and *ripened* into blood.

BUT although this seems to be the most simple and rational theory of accounting for *Digestion*, it is not unexceptionable, and far from being universally adopted; for, some Physiologists have ascribed it to animal heat; others to a dissolving ferment in the stomach, and others

to its action, or muscular force on the contained aliment; but, indeed, it seems rather to be effected by a combination of causes, or concurrence of the whole, viz. by heat, moisture, and motion.

PUTRID substances taken into the stomach of carnivorous animals, have been found *sweet* and inoffensive to the smell, soon after being swallowed; and, in those living solely on herb-
age, no signs of fermentation could be discovered when examined in the same manner: Hence there is reason to think that Digestion is neither performed by a *putrid*, or an *acescent ferment*, and that, when either of these qualities prevails in the stomach, they are not natural but morbid appearances, and certain signs of a *bad Digestion*.

WE see, therefore, that this obscure, animal process is still a secret in nature, having, for many ages, divided the opinions of Physicians and Physiologists, several of whose doctrines, though directly opposite to each other, have notwithstanding been strenuously supported by
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their advocates as right : This plainly shews, that, instead of real and substantial knowledge, we have only been presented with vague and often inconsistent surmises, which, without doubt, some have advanced from a conviction of their truth, others from a desire to advance something that might appear new, and others from personal enmity and the spirit of contradiction, contending for superiority rather than truth.

FROM what has preceded, it will evidently appear, how that vital stream, *blood*, is continually supplied and replenished with fresh chyle passing into it by the milky vessels, like so many little currents which keep up the circulation, and repair the daily waste made by exercise and the natural discharges of the body; and how *Indigestion*, or a fault in the vital functions of the stomach and bowels, and their want of power to elaborate and prepare those nutritious juices, may at last, vitiate the solids and produce ill health; for, by a kind of real *transubstantiation*, they are converted into the very substance of animal body; all its constituent parts, even the *bones* themselves, being originally in a fluid state.

UNDER such circumstances the constitution may not improperly be compared to the fabric of an edifice, the superstructure of which will frequently want repairs, when its foundation is bad and infirm.

HOWEVER opinions may differ respecting the precise manner by which *Digestion* is brought about, it is certain that the *Stomach*, like the Heart and other vital parts, derives its principal power and energy from the *nerves*; for, when *those with which it is supplied are cut or injured, both Appetite and Digestion are suddenly destroyed.*

S E C T.

S E C T. III.

The SYMPATHY and communication of the STOMACH with other parts of the body, and their mutual affections thence arising.

THE Stomach, as already observed, being the great source of nutriment, and amply supplied with nerves, the instruments of all sensation, holds a twofold intercourse with every part of the body; first, by the conveyance of Chyle into the blood; secondly, by *nervous sympathy*, from which its impressions are communicated to the brain and other parts, giving it extensive and extraordinary influence over the whole corporeal system; insomuch that there are few *chronic diseases* in which the *stomach and bowels* are not affected. Accordingly we find, that, whenever the body is invaded by any morbid cause, or the mind oppressed with sorrow, the stomach immediately feels their malignant power. It then neither

craves nor can dispense with its usual food; both appetite and digestion suddenly cease; nausea and sickness succeed, and its contents are rejected; and, as it is thus affected at the attack of a disease, so the first signs of convalescence are usually attended with a return of appetite and digestion.

UPON the state and condition of this organ, therefore, in a great measure depends the *health and well-being of the animal body*, and also the efficacy of such medicinal substances as may be found necessary to relieve its maladies; for, here their power is first exerted; and, although some of those may pervade the system, as *Alteratives*, and act in a manner peculiar to their own nature; their operation will be considerably diversified according to the degree of *sensibility* and *irritability* existing in the *stomach*, as intimately connected with the general habit; a circumstance, which, in the treatment of diseases, has not always been sufficiently attended to.

THE strength and weakness of the animal body, and the regularity of its functions, particularly those of the stomach, seem principally to depend upon the *nervous power*, which is increased or diminished from various accidental causes: Thus, pure, fresh air, the chalybeate waters, and cold bath which brace the solids, add greatly to bodily strength; and wine or warm cordial liquors, by invigorating the stomach for a time, not only communicate strength to the body, but fortitude to the mind, by increasing the nervous power. On the contrary, a putrid, inelastic, moist air; long fasting, grief, or intense study, are found to diminish bodily strength, to *impair Digestion*, and lay the foundation of *chronic diseases*, hereafter to be treated of; and which could not have been so well understood without this previous knowledge of the very source whence they originate.

For a particular proof of the more general and immediate communication of the stomach with other parts, may be mentioned that
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tormenting pain the *tooth-ache*, which has frequently been relieved by a large dose of *opium*, taken into the stomach, before it could enter the blood, or arrive at the part affected by the common road of circulation. The trembling hand of a hard drinker presently becomes more steady, for a time, after taking a cordial dram, merely by touching and invigorating the nerves of the stomach; and, on the contrary, the subtle and insidious power of the *lauro-cerise water* is destructive to animal life, in a few moments! As violent affections of the mind will disorder the stomach, so a morbid state of that organ will mutually affect the mind and occasion languor, hypochondriacal complaints, low spirits, and melancholy.

THE Brain and mental faculties are observed to suffer from injuries of the stomach, and *vice versâ*; for, a violent blow on the head, or concussion of the brain, will excite that convulsive motion of the stomach called vomiting; and a profusion of bile, or other offending gross humours in the stomach will occasion giddiness and head-ache.

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So great is the sympathy between the head and stomach, that it is difficult to know which was originally affected, although an improper distinction, on such occasions, might be attended with the most dangerous consequences; for example, should a blister be applied to the head when only affected by sympathy from bile at the stomach; or should an *emetic* be administered when the patient is seized with vomiting from inflammation of the brain; the first would occasion unnecessary pain, and the last, by straining the body and overcharging the inflamed vessels of the head, might produce *delirium*, *apoplexy*, and *death*.

THE better to make a true distinction in such cases, it will be proper to observe *whether* the *head* or *stomach* was *first affected*; for, thence may best be known the original seat of the disease.

THERE is also a manifest consent between the stomach and skin; for, an eruption on its surface, like the *nettle-rash*, after eating *muscles*,
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mushrooms, or other noxious substances, has often been observed to terminate their bad effect. Besides, when the pores of the skin have been obstructed, or, in other words, when the patient has taken cold; the perspirable vapor, which ought to have been carried off from the surface of the body, by falling on the internal parts, occasion flatulence, pinchings in the bowels, colic pains, or a diarrhœa; and the same bad effect is the consequence of exposing the body to easterly winds, or a stream of cold, damp air.

SUCH *Sympathetic Disorders* of the stomach and bowels from obstructed perspiration, are most effectually relieved by external application, namely, the warm bath, flesh-brush, plentiful dilution, opiates, and wearing flannels next the skin.

THE stomach also communicates with the *liver* and *kidneys*; for, the stone and gravel frequently produce *vomiting*, and a profusion of bile, which can only be removed by attending to their cause.

A REMARKABLE degree of sympathy also prevails between the stomach and uterus; for, women after conception are often visited with sickness, or vomiting; and the violent efforts of labour-pains have the same effect.

FROM what has been said, it follows, that such is the intercourse between the body and mind, and so great the sympathy of the stomach with different parts of the corporeal system, that they alternately communicate their sensations to each other. Thus, local disorders of that organ, will at length affect the whole constitution, and produce *chronic diseases*, in consequence of *indigestion*, and *crude chyle*, by which the blood is impoverished and rendered unfit for nourishment; hence, the *gout* and *scurvy*, a *dropsy*, or *consumption*.

ON the contrary, although the stomach had previously been in a sound state; should the mind become deeply impressed with *grief*, or
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the *vital parts* attacked by *gouty*, *scrophulous*, *venereal*, or *scorbutic* matter; both *appetite* and *digestion* fail; pain, sickness and vomiting are brought on, and oftentimes confusion of ideas, loss of memory, *dejection of spirits*, *melancholy*, and *despair*.

SUCH is the extreme sensibility of the *stomach*, especially when disordered or inflamed, that the skin when excoriated by a blister is not more exquisitely tender; so that harsh irritating food, scarcely affecting the palate, will then produce violent pain, sickness and vomiting.

By the same exquisite sensibility it is endowed with elective or instinctive power of chusing whatever is grateful and beneficial to itself, or refusing what is injurious to the constitution; and therefore, by some it is not improperly called the *conscience of the body*: When the stomach says no, every morsel would be poison, and not nourishment; but, if it consents or asks for more, more may be safely taken. There are very few who have not some particular propensity or aversion to certain kinds of food; cheese, honey, or other things

things of the like nature, which are agreeable to some, act on others with the violence of poisons.

THUS, like a watchful centinel, the *stomach* gives warning, and denies admittance to what would be injurious, and often craves with avidity such things as prove salutary. Hence, the eager thirst for cold water in the height of a burning fever, which, being drank, has been known to terminate the disease and save the patient's life, after the power of medicine had been tried in vain.

PERHAPS it may be objected, that the *Stomach* is not its own sufficient guide, because it does not always discover the insidious and deadly power of some *poisons* till too late: but we might as well complain of dim and defective eyes, because they do not as easily perceive a mote as a mountain; or since minute objects are more distinctly seen by the assistance of a microscope than the naked eye.

IN short, what *Damocrates* says of the *womb*, viz. that it is an animal within an animal, might with more propriety be applied to the *stomach*; so faithful a monitor is that organ, and so truly wonderful its distinguishing faculty, whilst it remains in its natural state, and *uncorrupted by Intemperance*.

S E C T. IV.

The nature, treatment, and cure, of idiopathic or primary diseases of the STOMACH and BOWELS, proceeding from INTEMPERANCE, CULINARY POISONS, the ABUSE OF MEDICINES, and other causes. With the necessary distinction between those primary affections, and such as are symptomatic or secondary.

IN the preceding section of this Essay, the nature of Animal Digestion, and Sympathy of the Stomach with other parts of the body, have been amply considered, as a general Introduction to the treatment and cure of the various diseases incident to the *abdominal Viscera*; among

among the first of which, those prevailing maladies, *Loss of Appetite and Indigestion* claim the first attention; for, whether they are simply *idiopathic* and *originally* seated in the stomach itself, or *symptomatically* produced by a *translation of gouty matter, profusion of bile*, or other accessary causes, they will occasion Chronic Diseases which cannot be effectually cured till these complaints, in the first passages, are previously taken away.

It would prevent many dangerous errors in medical practice, if such Diseases of the *Viscera*, as are simply organical or *primary*, were truly distinguished from others which are symptomatic or *secondary*, and arise from a *morbid state of the constitution*; for, it is evident, that they must all originate from one of these two causes; which, though perfectly distinct in their nature, have, notwithstanding, been frequently confounded with each other, or slightly passed over, without discrimination, as maladies requiring nearly the same method of treatment.

I know it has been suggested by some authors, that the distinction here mentioned is not abso-

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lutely necessary ; because, as Indigestion may be owing to want of tone in the general habit, and communicated to the stomach ; so the tone of the stomach restored, may be returned to the habit.

THIS seems a vague and exceptionable opinion, and ought to be adopted with great reserve ; for, it can only apply in cases *where the solids are simply affected, and not in Diseases proceeding from a vitiated state of the fluids* ; which, of all others, are the most dangerous and difficult of cure.

INDIGESTION arising from *simple weakness or relaxation*, cannot, with propriety, be treated in the same manner as when it proceeds from a *distempered blood*, and a translocation of *scrophulous or venereal matter* to the viscera. In the first case, the disease might be relieved by *Tonics*, which brace the fibres, and give strength to the vascular system ; but the last would require such medicines as tend to subdue and evacuate the morbid juices from
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the constitution; consequently, should *Tonics* be directed in their stead, they would concentrate and lock up the offending matter, and probably destroy the patient: On the contrary, in the first case, the solid system, which was too weak before, would still become more relaxed and debilitated by a course of evacuating Medicines.

By close attention to the morbid changes produced in the living body, and what will be hereafter advanced on the present subject; I think it will become apparent, that *few Diseases of the stomach are originally local, or inherent in that part*, as generally supposed; those only excepted, which are occasioned by *Intemperance, unwholesome Diet, culinary Poisons*, or the abuse of *strong, drastic Medicines*; more particularly, the *immoderate use of Mercury*, where the injury is immediately impressed upon the stomach itself.

It appears still more evident, that local imbecility of the stomach, considered as simply such, is seldom the sole cause of its morbid

affection; when we observe the instant *loss of strength, appetite, and digestion*, from any sudden shock of the mind, as the arrival of bad news, or other circumstance of poignant and deep distress; when it is no sooner struck by the impression, than it instantly *becomes atonic*.

IN farther support of this opinion, may be adduced the effects of *Sea-sickness*, which, by mere motion disagreeably impressed upon the Brain and Nerves, and without any other previous change in the solids or fluids; at once deprives the stomach of its natural power, and produces intolerable *sickness* and *vomiting*, with universal loss of bodily strength.

THOSE two evident causes of morbid *sympathetic affection*, the one resulting from the body, the other from the mind, and where both are suddenly and manifestly produced, can be accounted for upon no other principle than *nervous influence*, from the want of which, the stomach as well as the whole corporeal system are deprived of their natural energy.

EXCESSIVE

EXCESSIVE *Flatulence*, or immense quantities of air discharged from the stomach, in those of *bad Digestion*, particularly after *obstructed perspiration*, or *previous to a fit of the Gout*, though a common and very oppressive complaint, has not, as far as I know, been accounted for in a rational and satisfactory manner : This Symptom is not void of danger, as generally supposed, being frequently the forerunner of a *Tympanites*, or *Dropsey*, as I have, in two or three instances, observed. The air thus discharged, being much greater in quantity than what could possibly be contained in the aliment of the stomach, inclines me to think it may also proceed from another cause.

THE human body has two sorts of vessels opening into all its cavities ; the first pour out a fluid to moisten their contained parts, and are called *Exhalents* ; the other imbibe superfluous moisture, and are called *Absorbents*.

FLUIDS injected into the alimentary tube, by clysters, are soon so perfectly absorbed, that not the least part of them is afterwards

evacuated; from which it may reasonably be concluded, that in cases of excessive flatulence, *the air chiefly escapes from the orifices of the exhalent vessels; especially when rarefied by febrile heat, or set at liberty by a putrid dissolution of the blood.*

It appears by experiment, that animals in the exhausted receiver of the *Air-pump*, are sensibly relieved by voiding *particles of air* from the surface of their bodies. In order, therefore, to restore the balance between the external and internal air, so essential to the well-being of all animals, it is extremely probable there is a free communication between them; and that, when the external air is light, a due quantity of internal air escapes through the cutaneous pores, lest it should burst its vessels, for want of sufficient counter-pressure: On the contrary, when the external air suddenly becomes heavy, part of it finds admission into the blood, by the lungs, to preserve a due balance; and lest the body, by sustaining too much external pressure, should be destroyed.

THE property of discharging air from *vegetables*, and again absorbing it, has been demonstrated by Dr. *Hales*; and, however new the opinion, if such it be, I see no reason why the same law of nature may not also obtain in *animal bodies*; for, if air was not discharged from the body, as well as admitted into it, the balance, between the internal and external air, could not be restored.

THAT *Air enters the blood in the Lungs*, that it combines with, and imparts to it a *florid colour*, is not matter of surmise or mere conjecture, but has lately been demonstrated in a satisfactory manner; and, in proportion to the purity of that fluid admitted into the blood, the countenance has been observed more or less *florid*; for, those of a pale and sickly aspect, from residing in the confined air of large, unwholesome cities, become fresh-coloured and ruddy by removing into the country, where they breathe a more pure, dephlogisticated atmosphere.

AIR, thus absorbed by the lungs, seems to be the vivifying principle which gives colour

to the blood, as well as life and animation to the whole system, and is probably also the principal cause which *preserves it from putrefaction*; for, it has been proved, that pure air not only enters the blood by the act of inspiration, but that *impure* or *mephitic* air is discharged or expired: To which may be added, that contaminated vapour which escapes from the body with *perspiration, urine, and stool*; still farther tending to accomplish the great purpose of nature, in preventing that corruption of the blood and juices which otherwise must have happened. So that, when we consider the vast quantity of vapour, or perspirable matter, continually breathed out by the Lungs, we shall have less occasion to think the opinion of the antients exceptionable, who termed the lungs the chimney of the body.

INDEED it appears perfectly reasonable and consistent to suppose, that nothing passes into the animal body, but what, in due time, may pass out of it again; and thus, by a continual accession of new matter and the discharge of what was become useless, that *renovation and*
purity

purity of the blood is preserved, so necessary to its well-being.

WHENEVER *Flatulence* prevails in a very high degree, joined with loss of appetite and *Indigestion*, there is reason to apprehend some morbid cause; either *gouty matter* prevails in the habit, *putrid tendency* in the blood, or there is *defect in the natural secretions or excretions*, which, suffered to continue, might endanger the constitution.

IN the year 1789, I attended an elderly gentleman in Pall-mall, who was *gouty* and *dropical*, and so grievously afflicted with *Flatulence* and oppression at his stomach, that, although the abdomen was enormously enlarged, complained he suffered more from wind in the stomach and bowels, than the watery swelling of his belly. He was always relieved by perspiration, and a flatulent discharge; but, becoming gradually weaker, was seized with fainting fits, and presently expired.

FARTHER to evince that *Flatulence* often proceeds from the discharge of air by the exhalent vessels,

sels, as well as from the contents of the stomach; it is necessary to remark, in the above case, the patient took so little nourishment, that his stomach was generally empty: Also, that after taking cold, especially in Autumn when perspiration is inverted and turned upon the viscera; excessive *Flatulence* always most prevails, without regard to the quantity or quality of food.

THE medicine, from which, I have observed the most immediate good effects, in such cases, was the *camphorated Mixture, with Hoffman's anodyne liquor, and tincture of opium*; but the relief given in this manner is only temporary: To render it permanent, regard must be had to the causes of the disease already assigned,

It will be right, at all events, to keep the pores open, and the bowels gently laxative by the *aloetic pill*; lest the confined air expanded by heat overstrain their fibres and produce a *Tympanites*. If perspiration be obstructed, as it generally is; *antimonial tincture joined with that of opium, and added to the camphorated mixture*, will always be found of service; and, even should the case be *gouty*, will contribute to the patient's relief.

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WHERE putridity is supposed to prevail, a strong infusion of *Peruvian bark*, with *mineral acid*, *spiced claret*, or *Port wine* may be liberally administered as an *antiseptic*, to strengthen the solids, and confirm the texture of the blood; and, in cases of the worst kind, pimento, or ginger-tea, may occasionally be taken, but should never be long continued.

THAT species of *Flatulence* occasioned simply by *effervescence*, and the expansion of air in food at the stomach, may be much relieved by abstaining from fluids, and crude fermenting substances; especially such vegetables as largely contain it, of which kind are turnips, peas, beans, and other leguminous grain of the viscid, tenacious kind, leavened or fermented bread, &c. instead of which sea-biscuit may be used; and wine, as well as all fermented liquors, should be superseded by toast and water with a small portion of French brandy.

THE *Peruvian Bark*, mineral acids, and aromatic bitters will lessen the tendency to fermentation at the Stomach, and increase its tonic power. For this purpose, I have found
nothing

nothing better than the following simple Medicine, viz. flowers of Sulphur with conserve of orange-peel, made into an electuary, with syrup of ginger; of which the quantity of a nutmeg may be taken as occasion requires. It generally opens the bowels, and seems to retard fermentation, from the *Acid* largely contained in the Sulphur.

NOTHING will so much accelerate Fermentation and increase flatulent swelling of the Stomach, as *Air* and *Moisture* put in motion by febrile *Heat*, especially when the body is coëstive; therefore, those who are affected with that oppressive disorder, should endeavour to avoid this combination of causes by which it is chiefly produced.

FROM the preceding observations, on the distinction between *organical* Diseases, and those which are *symptomatic*; the method of cure will become obvious; namely, to remove, if possible, the immediate cause locally impressed on the stomach; or those more remote, which
 universally

universally affect the constitution; and which are communicated to it by *sympathy*, or the mediation of the nerves.

THE first of those intentions is often as much in the patients power, as that of the most skilful Physician; at least, without his concurrence and prudent caution, the best advice will little avail: But, in the last, when the *blood is contaminated by a morbid cause*, and the general habit affected; almost every thing depends upon the judicious administration of effectual Remedies. In this and the following Section, therefore, the *nature, treatment, and cure* of those Maladies will be more particularly specified and explained.

THE *Stomach* and *Bowels*, being endowed with exquisite sensibility, are liable to many disorders from the very nature of their office, by Intemperance or errors in Diet; for, the aliment constantly passing through them may offend, either by its excess of quantity, or bad quality; the first will overstrain their fibres, and create pain and oppression; the last
may

may wound or corrode their tender nervous lining, and occasion *colic pains, inflammation, convulsions, a mortification*, and sometimes death itself.

INDIGESTION is so frequent a malady in this country, particularly in great cities, that it may be deemed *endemic in Britain*; whose inhabitants, from its insular situation, are exposed to all the vicissitudes of heat and cold, moisture and dryness, in a short period of time. But it may also be owing to other *adventitious causes* common to all places, viz. to errors in Diet; the unwholesome occupations of some; the sedentary life of others; and anxiety of mind attending the eager pursuits of business.

THERE is a kind of constitution in the mind as well as the body; nor can either sustain violence, beyond a certain degree, without injury, according to the natural sensibility existing in the one or other. Those moving in a high and public sphere of life, who are plagued with honours and persecuted with solicitations; who are obliged to dissemble their feelings, and live,

as it were, at variance with themselves; also experience in their health the bad consequence of disappointed ambition, and such vexations and vicissitudes as are inseparable from human affairs.

Loss of Appetite and Indigestion sometimes arise from relaxation or local imbecility of the Stomach, and none are more subject to such complaints than those who lead a sedentary, monastic life, and are intemperate in eating and drinking. Under such circumstances the *ingesta* will be imperfectly subdued, and, the quantity taken into the body being more than equal to its consumption; a bloated, anasarctous habit will ensue; particularly, as the natural excretions, for want of sufficient exercise, will be unduly performed: Hence, the solids being daily more distended by the weight of the redundant fluids; the balance, which ought to be preserved between those two powers, will be destroyed, and the body daily decline from its usual strength and vigour.

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WHEN the stomach is repeatedly overcharged with full meals of animal food, it will lose its natural tone by such frequent plenitude and over distension; and its contents being indigested, the chyle obtained from it will be crude, impure, and insufficiently elaborated. The several secretions being also unduly performed, a foundation will be laid for *chronic Diseases*, especially the *gout* and *scurvy*, a *dropsy*, and *hypochondriacal disorders*; so that one train of evils leads on to another; but if they are not the effect of a bad constitution, but of that indiscretion which tends to make it so; their cure is not to be sought for in the use of medicines, but in *moderation* and *Temperance*. Let the patient take less Food and more Exercise, and he will not want a Physician.

FROM whatever cause the Stomach is deprived of its natural, digestive faculty, it may be laid down as a general rule, that spare diet and *abstinence* from solid, animal food will afford relief. By such means, the patient will avoid the inconvenience of sleepiness, palpitations of the heart, flushings in the face, with hectic fever,
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and other symptoms after eating, so oppressive to the weak and infirm. But there will be less occasion to enforce the necessity of such regimen, as the stomach is its own sufficient guide, and at such times, nauseates all animal substances.

THE propriety of spare Diet will appear more particularly necessary for such invalids, as they generally use less exercise and perspire less than others. Their solids are also more lax, and consequently their digestion is weaker.

IF the patient after eating is much oppressed, sleepy, and affected with internal throbbing about the region of the heart; in a word, if his body and mind are less vigorous and fit for action than before, he has then exceeded the proper *quantity* of food, and should take care to subtract from it at the next meal.

How far the *qualities* of *Aliment* are of consequence to health, may be evidently seen in the most dreadful of all human calamities, a *Famine*, which is frequently followed by the *Plague*.

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from the extreme scarcity of wholesome food which then unfortunately happens.

As the animal juices are accumulated by nourishment and rest, and consumed by abstinence and motion ; it is a circumstance of the highest importance to proportion them duly, that a just and natural balance may be preserved between the solids and fluids.

INTEMPERANCE impairs the memory, destroys the distinct exercise of the reasoning faculties, and renders the mind less fit for study or deep meditation. When the quantity of food is too great, the vessels will be overloaded and the body oppressed; if too small, it will waste and decline; so that either very high or low living will injure health; but of the two extremes, the first is much more common and productive of greatest injury; since many who live intemperately are prematurely cut off by *Apoplexies*, or other violent diseases; and, on the contrary, the several instances of *Longevity* are chiefly to be found among those who live on spare and simple diet.

IN fixing a standard for *Temperance*, our own feelings, or even the Custom of certain places, would be very insufficient guides: We should rather observe in what degree of vigour and perfection, animal life is supported among the poor, who use simple fare, and live in a manner conformable to nature.

IF many of the Irish, with only *milk* and *potatoes* for their food, perfectly exercise all the faculties of body and mind; and whole Nations in the east, subsist wholly on *Rice* and *Vegetables*, yet live long and healthy; it will thence appear, that in this country, we might subtract largely from our full animal diet with great advantages to the constitution.

THE Regimen of Diet should not only be adapted to particular sexes and ages, but also to the nature of climate and degree of the patients exercise: General Rules must therefore have their particular exceptions according to the different constitutions for which they were directed.

VEGETABLE *food* is less nourishing and more flatulent than that of the *animal kind*, but it resists putrefaction and is most proper during the summer heats, especially for those of strong fibres, and scorbutic, bilious habits.

QUADRUPEDS living on flesh are generally fierce in their nature, and the exhalation of their bodies is rank and offensive; whereas animals feeding on herbage are much more gentle, their breath is sweet, and their excrement almost inodorous.

HENCE it appears, that much animal food is unwholesome, especially towards *Autumn*, in warm, moist weather, when the fluids tend to putrefaction; for, it will load the body with *rancid humours*, taint the sweetness of the breath, render the several discharges more offensive, and *dispose it to diseases of the putrid kind*; which may best be prevented or cured by *vegetable, acescent Diet*, abstinence from fermented liquors, and the liberal use of pure water, with fresh orange-juice, or a solution of the crystals of Tartar, called *imperial water*.

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How far the human constitution may be changed for the better by vegetable diet, is evident in those who have been cured of *inveterate Scurvies* by the plentiful use of *fresh vegetables*, and *pure water*, without any other assistance; and instances are not wanting, where even the irascible passions have been, in a great measure, subdued by the same means.

ARETÆUS mentions the cure of *Leprosy* by total abstinence from animal food, and the constant use of vegetables, in those afflicted with that loathsome disease; who, from fear of infection, had been abandoned by society, and driven out into a desert.

HE who means to be a *rational Epicure*, and to exalt the pleasure of eating beyond the reach of a sensualist, should eat with *simplicity* and *moderation*, for then only, he *will taste with the palate of nature*. If rich sauces, and high-seasoned dishes are grateful to some; they do not possess a natural appetite, but that which is depraved; for, children and young

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people disrelish all such aliment, and never grow fond of it, till their taste is vitiated by habit and bad example.

THUS, when the food and palate are both in their natural state, the relish is high, and the body duly nourished; but when, by the arts of compound cookery, the first is deprived of its soft, balmy quality, and rendered almost *caustic* by salt, cayen-pepper, and other high seasoning; they stimulate the languid appetite, turn round the wheels of life too rapidly, and *wear out the body before its time*. Whereas, those who abstain from much wine, spirituous liquors, or hot spicy aliment, acquire an exquisite degree of delicacy in the sense of tasting; their spirits are more equal, their feelings more pleasurable, and in general they are *much longer lived*.

IF the qualities and taste which things naturally possess are right and good in themselves, those communicated to them by the too officious hand of art, must surely be wrong. The cool, refreshing *Melon*, a native of scorching climates,

climates, intended to quench thirst and abate heat, is often robbed of its genuine properties by a profusion of pepper; and *acid fruits*, which would strengthen the stomach and resist *autumnal putrefaction*, are lost in the taste of sugar.

THUS the beneficent simplicity of Nature is superseded by *Custom*, which luxury, not propriety, has introduced; for, it must be confessed with regret, that in the affairs of human life, many are more guided by their passions and the example of others, than by reason or their own understanding.

THE good effects of Temperance are acknowledged by all, but duly regarded by few.

THE state and condition of the Stomach may best be known from the appearance of the *Tongue*; for, both are invested with the same fine mucous membrane; so that when the last is fresh, florid and moist; appetite and digestion remain unimpaired; but, on the contrary, when the tongue becomes dry, discoloured,

and coated with mucus, attended with thirst and a feverish breath; the stomach, as well as the lungs are then disordered.

As *loss of Appetite* is usually attended with nausea, or loathing of food; so *Indigestion* is accompanied with Flatulence and oppression, a bitter and disagreeable, *rancid* taste in the mouth partaking of the food; sour *eructation*, with heart-burn, flushing in the face, and a slow *hectic fever*.

In those of weak appetite and bad digestion, who live chiefly on *vegetable diet*; a *redundant acid* at the stomach frequently prevails, with excessive flatulence, *cardialgia*, or heart-burn. To remedy this inconvenience, it will be proper for the patient to increase the quantity of animal food, and to indulge moderately with things of a warm, alkalescent nature, such as horse-radish, mustard, &c. Instead of wine or malt-liquors; pure water, with a small portion of brandy, without sugar, will be less apt to ferment and occasion wind. This regimen, however, should be pursued with caution; for, a
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total abstinence from vegetables, and the too liberal use of animal food, would dispose the fluids to a dangerous state of putrefaction; therefore, the most wholesome diet will be found in a *due proportion of animal and vegetable substances*, which may be varied occasionally, according to the nature of circumstances.

A moderate quantity of salt, taken with our food, seems necessary to promote digestion; for, although according to the experiments of *Sir John Pringle*, one dram of salt in two ounces of water preserved flesh sweet twenty hours longer than pure water; he found, *that flesh, with from five to ten grains of sea-salt, putrified sooner than the same quantity infused in water only*; consequently, as salt is never taken with food beyond the corrupting quantity mentioned in the experiment; it appears necessary to digestion; for then it manifestly acts by its *septic power*, and will hasten the dissolution of animal substances.

A fresh supply of food, before the last meal is evacuated from the stomach, or whilst any
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of its indigested *sour leaven* there remains, is highly pernicious; since it would soon *excite fermentation in the next aliment and convert it into its own acid nature*, creating flatulence and heart-burn.

In such cases it will be proper to wash the stomach with a weak infusion of mustard seed; and, after giving a dram or more of *calcined Magnesia* as a laxative, to diminish the quantity of food, and to take it the oftner.

In a natural and healthy state of the constitution, Acids are not supposed to enter the blood. They seem not to extend their influence farther than the stomach; for, when they have passed into the intestinal canal, by meeting and mixing with the *Bile* they are *neutralized and subdued*; but, if at any time they pass unchanged into the blood, that will be most likely to happen when they too much abound, without a sufficient quantity of *Bile* to decompose, and correct them.

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SHOULD such cases occur; which indeed are rare and uncommon; the *lixivium of Tartar* in fresh whey, which would pass freely into the blood, might probably be found an effectual Remedy. The only instance of such a case which I have ever met with, was that of a gentleman at Hull, who lately applied to me for advice, in what he called a *sour Sweat*, which he assured me was as evident to the smell as vinegar, or sour small-beer. I advised him to take the above lixiviated whey, which in a short time removed his complaint, with many other *chronic ailments* under which he laboured, proceeding, as he supposed, from *acidity in the blood*; having by the direction of his Apothecary, to relieve a scorbutic disorder, eat three or four *Lemons* every day, for a considerable time, with large quantities of *Vinegar* and other acids.

THERE are three Articles by which the Stomach and Bowels may be materially affected, namely, *Tea*, *Coffee*, and *Tobacco*; the properties

ties of which we shall therefore consider, especially the two first, as they make a considerable part of our daily sustenance.

ABOUT a century ago, *Bentikoe*, a Dutch Physician, bestowed extravagant encomiums on the use of *Tea*, but, like a true medical enthusiast, he erred in the extreme; for, with him, it was good for every thing; although daily experience shews it pernicious to people of *lax solids and weak Nerves*. The internal tremor which it often occasions, especially *gunpowder Tea*, and the *imperial or high-flavoured green*; with its remarkable effect of *preventing sleep*, shew that it makes some peculiar impression on the nervous system, by its *fragrant Odour*, in which its pernicious quality seems to reside; for, when that is dissipated by a boiling heat, no such effect is found to follow.

For this reason, probably, the *Chinese* prefer a *decoction to an infusion of Tea*; and that they avoid its use till it has been kept one year. We are informed, that, in its recent state, it is endowed with a *narcotic* or intoxicating quality.

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This is verified by the experience of those who are employed in mixing large quantities of Tea, in close rooms, where the air is confined; being often seized with faintness, giddiness, and head-ache.

BOERHAAVE, and some others, supposed that the bad effects of *green Tea* were owing to its having been dried on hot plates of *copper*; for, as all metals, heated to a certain degree, throw off their metallic effluvia, it was reasonable to suppose, Tea thus manufactured, would be strongly impregnated with copper, the effects of which are known to be highly pernicious to the human body. Some even went so far as to imagine its fine colour was occasioned by *verdegris*, a preparation from copper; but, by experiments made on fine bloom teas, with *volatile alkali*, not the least sign of such poisonous adulteration appeared.

ALL *nervous Disorders* are certainly aggravated by the use of tea; and it is equally unfit for *children* and those of lax fibres, especially the first, whose fluids bear a much larger proportion

portion to the solids of the body than in adults, for whom it is more proper; especially those of a warm, sanguineous temperament. Green Tea is mildly *astringent*, by which the relaxing power of warm water is corrected; consequently, weak Tea drank too hot, will enervate; and, if very strong, it may prove equally pernicious by affecting the Head or Stomach.

WE are informed there is only *one species of the Tea-Tree** which is an ever green, and that the apparent difference of its leaf is owing to culture, its age when gathered, and the manner of being cured or prepared for use. My friend Dr. *Spink*, of Bombay, informed me, that the *Padrae fouchong-Tea* is much superior to all the rest in smell and fine flavour; the leaf is of a greenish yellow hue, but larger and more unfolded than that of the common sort; it is very scarce, and rarely brought to England, except as a valuable Present; it was used by the Jesuits, and is chiefly exported to Russia by Caravans.

* An elegant delineation, and accurate definition, of the Tea-tree, may be seen in Dr. Lettsom's Treatise on that subject.

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THERE are some apparent inconsistencies advanced by authors who have written on this subject: By one we are told, that green-Tea is mildly *astringent*; by another, that it is *relaxing*. Some say it is *narcotic*, and procures sleep; others contend, that, taken before bed-time, it assuredly prevents it. This last effect I think may be accounted for; since I have frequently observed very small doses of *Opium* act in the same manner; neither can it appear strange that the same thing should operate differently upon different bodies, as their Nerves are strung to different sensations.

UPON the whole, Tea, like other things, *derives its value from its proper use*, and is good or bad according to the state and condition of the patient's constitution; and, to determine this, he should rather consult the feelings of his stomach than the opinion of a Physician; for that will best inform him whether it be right to take it or let it alone.

WHEN it is drank in moderation, and *not too warm*, with a large addition of milk, and little

tle sugar; I believe, it will seldom prove hurtful, but, on the contrary, *salutary*: After study or fatigue, it is a most refreshing and *grateful Repast*; it quenches thirst and cheers the spirits, without heating the blood; and the pleasing society, in which we so often partake of it, is no inconsiderable addition to its value; for, whatever affords rational pleasure to the mind, will always contribute to bodily Health.

COFFEE is the fruit or berry of a small ever-green Tree, growing spontaneously in *Arabia*, but is now cultivated in the East and West Indies: The first sort is the best, and may be distinguished from the other, being smaller and of a darker, yellow colour. The flower is exquisitely fragrant, like that of the Arabian *Jessamine*, of which it seems a species, and the fruit is like a cherry, including the berry in a pulpy substance.

THE opinion of a late Author, that *Coffee* and *Tea* are of the same quality, has no just foundation; being not a little dissimilar in their nature and effects.

IN those of lax fibres and cold phlegmatic constitutions, Coffee will certainly be found more beneficial than Tea, being more warm and aromatic. It strengthens the stomach, assists digestion, and being grateful to the brain and nerves, is therefore called *cephalic*; but, on the contrary, with such as are of a dry, sanguineous habit of body, it is less proper. Being usually taken in smaller quantities than tea, it does not like that relax the solids, dilute the fluids, or promote perspiration and urine; but excites thirst, heats the blood, and renders the body costive. So great and essential is the difference between Coffee and Tea, of which daily experience, from our own feelings, affords the most ample testimony.

THE prejudices, however, of *Simon Pauli*, against the use of Coffee, are not more to be regarded than his erroneous opinion of Tea; for, he strenuously contended, that this oriental vegetable was precisely of the same species as the *Myrtus Brabantica* indigenous in Brabant, and by some called Dutch Myrtle. In the

north of England it is called *Gale*, and may be found in large quantities contiguous to the *Lake of Keswick*, and in the mosses near *Carlisle*. It has a very powerful and grateful smell, in the evening particularly, filling the air with so much fragrant odor as to be perceived at a great distance.

WE are next to specify the qualities of that *narcotic weed*, *Tobacco*, originally used by the Indian savages, in smoking, to procure sleep and abate the sense of toil.

It is not our business to enquire how far *Tobacco*, as an article of commerce, may become beneficial to trade, or increase the public revenue; but in what degree it may found injurious to the human constitution, as a reason for prohibiting its use. But, should the first consideration be seriously regarded; an *impost* upon brush-wood imported from the American thickets, *by way of commutation-tax*, would do as well for the service of government, and save the British subjects from the danger of being poisoned.

WE are informed, that the Indian Priests used the fumes of Tobacco until they became intoxicated, and as it were in an extasy, the better to prepare them for giving responses to their tribes, respecting the events of war, and on other weighty occasions.

THE Indians poison their arrows with the *oil of Tobacco* which, infused into a fresh wound, occasions sickness and vomiting, or convulsions and death; with what safety, setting aside propriety, the subtile powder of this plant, called *Snuff*, may be applied to the tender, internal surface of the nose, it may be proper to enquire; for, if the oil of Tobacco is a mortal poison when applied to the open vessels of a wound; surely this plant when taken in substance, as *Snuff*, must in a certain degree be injurious. From the infinite number of nerves diffused over the mucous membrane of the nose, it is endowed with exquisite feeling; and, the better to preserve the sense of smelling, those nerves are continually lubricated with moisture.

By the almost caustic acrimony of Snuff, this moisture is dried up, and those fine, delicate nerves, the organs of smelling, are rendered callous and insensible. To this self-evident, bad effect may be added the *narcotic* or stupifying power of Tobacco, by which not only the Brain and Nerves are injured, but also the Eyes depending upon their influence, together with the sense of smelling; and, from the force with which snuff is usually drawn up the nose, its passage will be obstructed, and the voice lose its clearness and distinct articulation.

BESIDES those pernicious qualities, Snuff often involuntarily descends into the stomach, creating nausea, loss of appetite and vomiting; and by its narcotic power will *diminish nervous influence* and impair digestion; it discolours the skin contiguous to the nose, and will taint the sweetest breath with the rank odor of a tobacco-cask. For this reason the Ladies of fashion in France, seldom take snuff till they are married; a very high compliment, no doubt, to their husbands.

THE only advantage of taking Snuff, is that of *sneezing*, which, in sluggish, phlegmatic habits, will give universal concussion to the body, and promote a more free circulation of the blood; but of this benefit, snuff-takers are deprived, from being familiar with its use.

WE have been told, that Tobacco, when *chewed*, is a preservative against hunger; but, this is a *vulgar error*; for, in reality, it may more properly be said to *destroy appetite by the profuse discharge of saliva* which has already been considered as a powerful, dissolving fluid essential both to Appetite and Digestion.

IN *smoking*, the fumes of Tobacco induce a kind of *pleasing insensibility* not easily described. Its *narcotic odor*, thus administered, equally infatuates the ignorant savage and the intelligent philosopher; but, by the large ex-
pence of saliva thereby occasioned, it is productive of many disorders of the head and stomach, particularly the last.

IN describing the qualities of *Saliva*, and *Bile*, we remarked, that these fluids have been experimentally found to *correct acidity in the stomach and to retard fermentation*; consequently, they prevent cardialgia or heartburn and *flatulency*. If therefore a certain quantity of *Saliva* be necessary to increase Appetite and promote Digestion, surely, the want of it must be detrimental to both.

SEVERAL years ago, Dr. Robinson published a pamphlet whimsically entitled a Treatise on the virtues of a *Crust of Bread*; but with more propriety he might have called it a treatise on the nature and qualities of *Saliva*; for, in it he has satisfactorily proved, that the large quantity of that saponaceous, *dissolving Menstruum* secreted in the mouth, by chewing a hard crust of bread before dinner, and swallowed into the stomach, will certainly create appetite and promote digestion. The diminution of those faculties, are not the only injuries brought on by *smoking Tobacco*; its *narcotic fumes* will stupify the Brain, and *deaden the invigorating power of the nerves upon the whole bodily system*.

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FROM these preceding facts, this practical inference will follow, viz. that the injury sustained by the use of Tobacco, will always be *proportionate to the loss of saliva*, and its *narcotic power upon the nerves*; consequently, *chewing* this vegetable, as it is the most *sordid*, so it is the most *injurious* method of using it; for, by its pungency in the mouth, much saliva will be secreted, part of which will be rejected by spitting, and the rest, strongly impregnated with its pernicious qualities, will be swallowed into the stomach, where, like all other narcotics, it will impair the tone and *suspend the digestive power* of that Organ. But, as this custom chiefly prevails among the vulgar, upon whom friendly admonitions are too frequently thrown away; I shall say little more on the subject; well knowing the great difficulty of eradicating prejudice from ignorant minds, though a circumstance much to be regretted.

TOBACCO smoke will kill musquitoes, flies, and other insects, and when applied to a naked nerve in the *tooth-ache*, though it also acts by its pungency, chiefly removes pain by its narcotic power.

THE desire of Tobacco, in those accustomed to it, is so insuperable, that rather than forego its use, they would part with half their food. Their propensity to it is equally prevalent with that of *Dram-drinkers* to spirituous liquors, without which, however pernicious, they become languid and debilitated, and are affected with nervous tremor.

To adopt what is pleasurable to our feelings or subservient to use, cannot be thought strange; but, that a rank weed, at first hateful to the taste, and hurtful to the constitution; should, by habit become desirable, and universally prevail throughout Europe, is a circumstance the most extraordinary, affording one striking instance among many, of the folly and infatuation of the human mind; and the force and prevalence of Custom opposed to Sense and Nature.

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INDEED, there is nothing so completely absurd, to which Fashion will not lend its temporary sanction, and stamp with the idea of excellence. Was this *Proteus-like* being only regulated by elegance or utility, it might be worth imitation; but often it is unconnected with either, and ever capriciously shifting from one extreme to another. It prevails for a time with *epidemic rage*, and governs both the rich and poor; 'tis, nevertheless, a phantom, — the Idol of fools! a creature of to-day and to-morrow, having no permanent existence, and seldom any value but what it accidentally borrows from time and place: The weak-minded obsequiously follow its fantastic extremes, and worship it as their chiefest good; but those who distinguish better adopt it with moderation, to avoid the inconvenience of being singular.

BUT, of all the evils which exert their baneful influence over the Stomach, none is so pernicious in its consequences as the *immoderate use of Spirituous Liquors*. Like *liquid fire*, they will harden and contract its fibres, and, as it
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were, cauterise and crisp up its tender, nervous lining; at once destroying both feeling and appetite, and rendering it a mere *Borachio* or leather bottle.

FOR this reason, those addicted to the pernicious habit of dram-drinking, are always complaining of a *cold stomach*, which, in fact, is rendered such by the very means they preposterously use to prevent it, and constantly repeat, to the slow, but sure destruction of their constitution.

BESIDES these bad effects of spirituous liquors, they harden animal food and render it indigestible. From the same heating power they contract the glands, coagulate their juices, and rob the stomach of its natural moisture, which, like the *Saliva*, is essentially necessary to promote Digestion.

BY such means, the *faculties* of the body and mind are injured, and at last destroyed; for, those who indulge in this pernicious gratification, soon lose their appetite, and are constantly troubled with *sickness at stomach* and *sinking of spirits*. — *Loss of memory,*

memory, confusion of ideas, and nervous tremor, are also its sad and certain consequences. In hot climates, *spirituous Liquors* produce frenzy; in cold ones, stupidity and abolition of the senses.

IN those who have died from the abuse of spirituous liquors; the *Liver, Spleen,* and abdominal viscera in general were found preternaturally hardened, and rendered as it were *coriaceous*, like leather. Excessive dram-drinkers are prematurely cut off by *consumptions, dropsy, asthma, or apoplexy.* But a circumstance the most extraordinary, is no less true, viz. the several parts of the body, even the very bones are rendered inflammable by the immoderate use of spirituous liquors; as appears from a case communicated by Mr. Wilmor to the Royal Society, of which the following is a short abstract; A. D. 1772. "A woman, who, for many months before, had swallowed from half a pint to a quart of rum, or aniseed-water every day, was accidentally burnt to death, at Coventry; though the fire in the grate had been small, and the furniture suffered but little, the greatest part of her body was consumed, and even the bones were completely calcined."

As many Diseases of the *Stomach and Bowels* originate from obscure and unsuspected causes, so they are frequently overlooked, or imputed to some fault of the constitution; such are those proceeding from *culinary Poisons*; the *adulteration of Aliment*, or the *abuse of drastic, violent Medicines*; and indeed, considering the innumerable and invisible avenues to the approach of Diseases and Death; with the infinite number, and complex structure of those parts which form the human body; instead of sometimes extending our existence to a hundred years, it is matter of astonishment, that we continue to survive beyond the short period of a single day.

Copper Vessels have been attended with so many fatal consequences in the preparation of food, that they were prohibited by the *Senate of Sweden* about the year 1752, which directed that none but those made of *Iron* should be used in their fleets and armies.

COPPER is easily dissolved by acids, and, from its solution, that poisonous substance called *Verdegris* is produced. *Vinegar and salt*, things in common use with our food, also strongly corrode it; and as all metals acted
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upon by fire, largely throw off their *effluvia*; from both these causes a considerable quantity of *cupreous poison*, of the most dangerous and subtle kind, may thus impregnate the aliment during its preparation, which being taken into the body, and as it were transfused through the blood, will pervade the vascular system, and have the same slow and baneful effect as that said to be produced by *Indian poison*, viz. the patient will gradually waste and decline; and there is reason to believe, that the frequency of *Palsies*, *nervous Disorders*, and *complaints of the Stomach*, are, in part, owing to this and such like causes.

FIVE *Monastics* out of thirteen, upon the continent, who eat soup prepared in an unclean *Copper Vessel*, several years ago, after suffering the most excruciating pain in the stomach and bowels, died by the effect of the *cupreous Poison*. The melancholy accident which happened to several gentlemen who dined at the Inn at Salt-Hill, though supposed to arise from adulteration of their Wine, was probably owing to the same cause. Some of them were suddenly taken ill and died soon after; others,

others, who survived for a time, were affected with pain in the bowels, and at last carried off by lingering illness.

BELL-METAL being a composition of Copper and Tin; metal spoons, and all other kitchen utensils of the same nature used in preparing food, should be laid aside for the same reason.

THE common earthen-ware in constant use, and not suspected of any bad consequence, also becomes *pernicious*, when it contains *Acids*, which is frequently the case in pickling, &c. being *glased* with *Lead*, another mortal poison; for, though it appears to have a fine glassy surface, this thin covering may easily be dissolved by hot, acid liquors, such as vinegar or lemon-juice. From these, the salt or *sugar of Lead* may afterwards be obtained, which, taken inwardly in any considerable quantity, has been found to produce spasms, and excruciating pains of the Stomach, with Costiveness and contraction of the Bowels.

If the poisonous substances, proceeding from Copper or Lead, have been recently taken; vomits are recommended to evacuate them speedily; but, where they have brought on great inflammation of the stomach, their violence might increase it, and produce *mortification*. Two parts of fresh *castor oil*, agitated with a third part of the mucilage of *Gum Arabic*, and given by short intervals, in the quantity of two or three spoonful till it produces a thorough passage of the body, will act more gently in carrying off the offending matter. The *common emulsion* with almonds and *magnesia*, may then be administered, and clysters injected with the mucilage of starch, the yolks of fresh eggs, and sweet oil, in tripe-water; which, being soft and balmy to the excoriated bowels, will afford them artificial mucus. Should these Poisons have entered the blood; a solution of *Gum Arabic* with *Manna* will not only keep the bowels *soluble*, but blunt their acrimony, in the same manner as when taken to abate *strangury* from the application of blisters.

CHINA, or Staffordshire Ware, are most proper for all those pickles and preserves, in which vinegar or other acids are principal ingredients.

TIN itself, though the most elegant and unexceptionable of all other metals for culinary use, except Iron, is not perfectly innocent; for, it has been experimentally found to contain a small portion of *Arsenic*, with which it has the greatest affinity, and so strongly combines, that the force of fire is scarcely able to disunite them: This perhaps may fortunately be the reason why food, prepared in tin vessels, has scarcely ever been known to produce bad effects.

Most of the tin ores contain *Arsenic* which is not entirely separated by the common process of fusion: *Margraff* asserts, that from Tin, estimated pure, he obtained one-eighth part of the crystals of Arsenic; from which, Tin, administered to the human body, probably becomes destructive to the tape-worm.

MUSHROOMS, and the *lauro-cerasus* or common *Laurel*, with berries like a black cherry, have been deemed noxious, though often used in food; the first in ketchups and ragouts, and the leaves, or distilled water of the last, to give a high flavour to custards, creams, &c. Taken in moderation, *Mushrooms* will seldom prove injurious; but *Laurel-water*, according to several late experiments, is perhaps the most subtle and *insidious Poison* in nature; for it seems immediately to extinguish the vital principle, and suddenly destroys without pain, or other previous signs of its mortal effects.

THE *bitter Almond* contains both a *Poison* and its *Antidote*; for, in its natural state, it may be taken as nourishment, with the greatest safety; but separate from it the two sorts of *oil* of which it is possessed, the one from its husk or exterior membrane, by distillation; the other from its *farina* or mealy part, by pressure; and we shall find, that *ten drops* of the first, in an ounce of water, will kill a dog in half an hour. Hence it appears, that many things

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prepared by the hand of nature, are salutary ; but, if we torture and disjoin their parts ; *wholesome, natural substances may then be converted into dangerous, artificial poisons.*

CONTRARY to the quality of other oils, which swim in water ; that red oil, thus obtained from the brown membrane of the bitter Almond, is ponderous and sinks to the bottom.

THE cordial dram, called *Ratafia*, much used in France, receives its fine flavour from the kernels of peach, black cherry stones, &c. and is therefore a *slow Poison* ; several instances having been lately produced of its proving mortal, when taken in a large quantity.

LAUREL-WATER has frequently been mixed with brandy, to give it the flavour of *Ratafia*, particularly in *Ireland*, where its dangerous effects were first discovered ; two women having been suddenly killed by drinking it.

THE spirit of *Lauro-cerasus* has been found even more deadly in its effects than its oil; insomuch that no degree of strength was sufficient to resist its power; and, from its singular quality of suddenly destroying every species of animal, it may be considered as the most dreadful of all known poisons, not even excepting those of the Indians, called *Lama* and *Ticunas* brought from the banks of the river *Amazons*; or that called *Woorara* mentioned by Dr. *Bancroft* in his Natural History of *Guiang*.

WHEN we consider the active powers of this fatal Poison, which, by its sensible qualities to the smell or taste, manifests no signs of its destructive nature, it will be difficult to point out its proper antidote. An *emetic* should immediately be given; and, from the good effects of diluted *volatile spirits* forced into the stomach of quadrupedes and applied to their nostrils, when in a state of *convulsion*, *paralysis*, or *stupefaction*, from having swallowed this poison; there is reason to conclude, that the same remedies,

assisted by gentle strokes of *Electricity*, *blisters*, *pungent injections*, and *concentrated vinegar* taken by the mouth, might produce happy consequences in the human species.

THE adulteration of *Bread*, *Beer*, and *Wine*, a grievance long and justly complained of, is another source of morbid affection in the human body, which has been fatal to some, and prejudicial to thousands; yet the abuse still continues, to the disgrace of Legislature which ought to be the watchful guardian of public good. In *Turkey*, such frauds meet with exemplary punishment; and in this as well as many other things, Christians might imitate Mahometans, without degrading their judgement or diminishing their humanity.

MEAL-MEN and Bakers adulterate the fine wheaten flour with others of an inferior kind, and to restore the whiteness which it loses by such mixture, chalk and other ingredients are put in, as well as to give it additional weight, by which they become gainers. *Alum*, a violent astringent, is also frequently added; and to counteract its quality, I am informed,

informed, that *Jalap* often makes a part of the composition. These are not mere conjectures, but facts which have been repeatedly and incontestably proved.

IN Brewing malt liquors, the like frauds prevail. Gentian root, worm-wood, and green broom-tops, (happily not noxious) are substituted for *Hops*; and to supply the deficiency of *Malt*; *Cocculus Indicus* a poisonous berry used for intoxicating fish, and *Nuxvomica* the poison of kites and carrion-crows, are frequently added, to give strength to Porter and Ale; particularly, the *first of these ingredients*.

SOME, who drank largely of such liquors, were seized with *head-ache*, and *stupefaction* succeeded by palsy, nervous complaints and *diseases of the Stomach and Bowels*. *Spanish liquorice*, *salt of steel* or *green copperas*, by brewers termed C. G. are frequently added to *Porter*; the first to give it colour and mellowness, the last to bring it forward, or in other words, to make new

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beer

beer drink like old. Happily, such things are not hurtful. I have frequently observed the good effect of Porter in those of weak digestion who had *hectic beats* after eating, and some years ago sensibly experienced it myself; which probably was owing to the salt of Steel acting on the habit as a powerful *Tonic*.

SUGAR of Lead, the poisonous quality of which has already been considered, is frequently added to small, weak Wines, to prevent them from turning sour, or to recover such as have become so; husks of bitter almonds (a poison) have been infused in white Port, to communicate to a madeira flavour. Much of what is called red Port wine is not the juice of grape, but a mere composition of cider and spirits, with the addition of *Alum* to make it rough, and *Cochineal* to give it colour; and, by the same dexterous art and mystery of composition, *Mosel-wine*, with a small portion of mineral acid, is converted into old Hock.

ALL white wines affect the brain and nerves more than those which are red, (Rhenish and Old Hock excepted,) their sedative power being probably counteracted by astringency; and if Rhenish wine does not equally affect the head, it is because it abounds with *acid* which corrects its inebriating power; for *acids* previously taken into the stomach, have been experimentally found, in a considerable degree, not only to abate the narcotic effects of wine, but even of *Opium* itself.

I AM far from supposing those iniquitous practices are carried on by all Bakers, Brewers, or Vintners; but that they have long prevailed with many and are still too frequent, needs no farther confirmation, than an appeal to those, who by certain Experiments, have been able to detect such frauds, and to distinguish the difference of the articles under consideration, in a pure or adulterated state.

As the rational practice of Physic redounds to the public good, so nothing can be more dangerous or destructive to health, and even life itself, than the *abuse of Medicines*, especially those of the powerful kind. This observation is every day verified by the injudicious use of *Mercury*, in particular, from which many constitutions have suffered more than by the very disease it was intended to cure.

THE preposterous use of strong *Emetics* and *Cathartics*; the long continued exhibition of *Opiates*, and of warm *stimulating Bitters*; the unseasonable use of the cold Bath, and profuse *loss of blood* by the Lancet, have all had their share in aggravating some diseases and producing others, especially those of the *Stomach and Bowels*.

MERCURY or Quicksilver is a ponderous mineral fluid, consisting of minute globular parts, and the heaviest of all bodies, excepting Gold.

IN its purest state it seems void of acrimony, except when divested of its natural form by *chemical process*; and such is the peculiar property
of

of this fluid, that its ultimate particles still retain their spherical figure, though ever so minutely divided or resolved by heat into the most subtile vapor; and as it is supposed to act upon the human body by its *gravity, divisibility, and figure; it is probable that all elaborate chymical Processes, by changing its figure, lessening its gravity, and fixing its motion, rather tend to destroy than exalt its medicinal Virtues.*

MERCURY may injure the Constitution either by its *Quantity* or *Quality*. By its quantity it will preternaturally increase the blood's motion, and by overloading the vessels of the *Lungs* or softer *Viscera*, has frequently occasioned *spitting of Blood*, hectic Fever, and other consumptive symptoms.

By such means the *mutual Balance between the Solids and Fluids being destroyed*, the vital functions become rapid and irregular, and the *body will be worn out before its time*; like a watch or machine whose *main-spring* is made to act with too much violence upon its subordinate movements.

WITHOUT

WITHOUT disregarding the testimony of truth, it cannot be denied, that this remedy is often attended with consequences not only dangerous, but fatal; where the *Lungs* are tender, or any of the delicate, internal parts in a state of *Decay*.

SALIVATION, or the immoderate use of Mercury, by enlarging the Secretions, and the excessive waste of animal fluids, will dispose the body to universal relaxation, and produce many chronic diseases, particularly *spitting of Blood, Consumption, and Dropsy*.

Loss of *Appetite* and *Indigestion*, are likewise disorders more immediately arising from *Relaxation* and general weakness than any other cause; for, whatever braces the fibres and increases the powers of the body, seldom fails to restore the Stomach to its natural state.

ALMOST every one, from experience, may know the injury of a simple *Sprain*, and how long it is before the injured part regains its former Strength. The same cause will also
account

account for the excessive weakness which follows a high-raised Salivation, or the immoderate use of *Mercury*; for, in both cases, the nature of the injury is the same, *viz.* the application of a *greater force* to the Solids than their natural structure can bear; only, in the first, the effect is instantaneously produced in a particular part, with the sense of pain; but, in the last, is universal, and brought about by degrees so slow and insensible, as not to give such manifest and immediate marks of danger.

THAT the tender blood-vessels of the finer *Viscera* may be *over strained*, and even *torn asunder by Mercury*, is proved to demonstration by Dr. Moulin, in the *Philos. Transact.* No. 192, p. 486. where, by injecting crude Mercury into the jugular vein of a Dog, the mercurial globules had burst through the small vessels in the lungs, and forced their way to the surface, separating their external covering in form of small blisters, where *he found globules conspicuous to the naked Eye*; and as
this

this seems pertinent to the present subject, I shall transcribe his own words, as the result of his Experiment.

“FROM hence may appear the danger of using
 “ Mercury in human bodies, so as to get into
 “ the mass of blood, especially in the Lungs,
 “ because they are of a lax, spongy texture,
 “ and want that brisk, strong motion which
 “ the muscles have in other parts, whereby
 “ they are enabled to force it along with the
 “ blood in order to the raising a Salivation.
 “ That Mercury has this effect on the human
 “ Lungs, is plain from what we daily see in
 “ persons that have been salivated, who are
 “ afterwards observed to die of *Consumptions*
 “ *that will yield to no Medicine.*”

THIS Observation is farther confirmed by Mercury found in the spongy decayed bones, and cellular substance of the skull, in those who died after a high-raised *Salivation*.

IN a word, the *immoderate use of Mercury* has been observed, from repeated experience,
 greatly

greatly to injure the Brain and Nerves, as well as the Stomach and Bowels depending upon their influence; and thus, by weakening the animal system, subjects the Patient to Gout, Debility, nervous Disorders, loss of Memory, confusion of Ideas, low Spirits, and premature old age.

THE quality of Mercury is not less pernicious to the constitution, than its immoderate quantity especially when adulterated. I knew a young gentleman not nineteen years of age, attacked with a violent fit of Gout, soon after a salivation, of which it was evidently the exciting if not the proximate cause; as he had not before been subject to the least symptom of any such malady.

THE pernicious quality of Mercury, in the form of *Corrosive Sublimate*, is too manifest to need illustration. A Gentleman from Norfolk, some years before he was under my care, was rendered incapable of walking with his body upright, from *Inflammation and Contraction*
of

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of his *Bowels*, brought on by taking the *Solution of Sublimate*, and died by the consequence of its use.

I HAVE seen two instances of a Salivation brought on by the external use of *Sublimate* applied as a Lotion; and one, where the same accident happened, by the application of *red precipitate of Mercury* to an ulcerous sore.

Corrosive Sublimate consists of Mercury combined with the acid of sea salt; so that each mercurial particle may be considered as armed with saline *Spiculæ* or sharp needles, which admitted into the stomach will wound its tender nervous lining and occasion the most excruciating torture. When this poison is taken into the stomach, either by accident or design, the most speedy and effectual method to destroy its power and prevent its mortal effects, especially when it cannot be rejected by vomiting, will be to *decompose it*; that is, to detach the mercury from its union with the *marine Acid*. This may be done by giving lixivium of tartar, salt of wormwood, or any of the alkaline salts mixed with a sufficient quantity of water. An
emulsion

emulsion with *Castor-Oil* dissolved in the yolk of an egg or united with a sufficient quantity of the mucilage of gum arabic may then be administered to heal the excoriated bowels, and carry off the remains of the poison.—The same method of treatment may be pursued with those who have swallowed *Arsenic*.

A SOLUTION of *Corrosive Sublimate of Mercury* was frequently administered several years ago; but having, in some, occasioned violent sickness at stomach, and in others excruciating pain in the bowels, with *bloody Stools*; its use is now discontinued by all who value their patients safety, or their own reputation; especially since it has been supposed, that *Arsenic* has sometimes been mixed with *Sublimate* to give it a whiter colour; but this opinion does not seem well founded.

WHERE Mercury is intended to be administered, the safest way of introducing it into the body is by unction applied to the skin; but even this method is not void of danger; for *Lead* is often mixed with *Mercury*, from which it cannot be separated by straining or other mechanical

mechanical operation; and to the *slow Poison of Lead*, thus admitted into the blood, may be imputed some of the bad effects of Mercury, which ought therefore always to be purified by distillation.

OPIMUM, the inspissated juice of the *Theban Poppy*, in its medicinal effects on the animal system, is the most extraordinary substance in nature.

It touches the Nerves as it were by magic and irresistible power, "*and steeps the Senses in forgetfulness,*" even in opposition to the determined will of the Philosopher or Physiologist, apprised of its *narcotic Effect*.

THE modification of matter is infinite; and who shall truly say, by what peculiar, or specific configuration of its parts, *Opium*, even in the quantity of a single grain, administered to the human body, shall *assuage the most raging Pain, and procure profound Sleep*?

THE action of matter upon matter, thus exemplified in the effect of *Opium* on the animal system, is not less astonishing and incomprehensible, than that of *Spirit upon Matter*, or the agency of Mind on the motive powers of the Body.

THE first effects of *Opium* are like those of a strong, stimulating cordial, but are soon succeeded by universal languor, or irresistible propensity to Sleep, attended with *Dreams* of the most rapturous and enthusiastic kind: After those *contrary effects* are over, which are generally terminated by a *profuse Sweat*; the body becomes cold and torpid, the mind pensive and desponding; the head is affected with stupor, and the stomach with sickness and nausea.

It is not my business, neither is it in my power, to reconcile that diversity of opinion which has lately prevailed concerning the manner in which *Opium* produces its effects; or to determine whether it acts

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simply

simply on the Brain and Nerves, or, according to the experiments of *Fontana*, on the mass of blood only.

OPIUM is the most sovereign Remedy in the *Materia Medica*, for easing pain and procuring sleep, and also the most certain *entispasmodic* yet known; but, like other powerful medicines, becomes highly noxious to the human constitution, and even *mortal* when improperly administered. Its liberal and long continued use has been observed greatly to injure the brain and nerves, and to diminish their influence on the vital organs of the body. By its first effects, which are *exbilarating*, it excites a kind of temporary delirium, which dissipates and exhausts the spirits; and, by its subsequent *narcotic power* occasions confusion of ideas and loss of memory, attended with nausea, giddiness, head-ache, and constipation of the bowels; in a word, it seems to suspend or diminish all the natural *Secretions* and *Excretions* of the body, that of perspiration only excepted.

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THOSE who take *Opium* to excess become enervated and soon look old; when deprived of it, they are faint, and experience the languor and dejection of spirits common to such as drink spirituous liquors in excess; to the bad effects of which it is similar, since, like those, they are not easily removed, without a repetition of the dose.

By the indiscriminate use of that preparation of *Opium* called *Godfrey's Cordial*, many children, in this great Metropolis, are yearly cut off; for it is frequently given dose after dose, without moderation, by ignorant women and mercenary nurses, to silence the cries of Infants and lull them to sleep, by which they are at last rendered *stupid, inactive, and rickety*.

OPIMUM contains Gum, Resin, essential Oil, Salt, and earthy matter; but its *narcotic* or somniferous power has been experimentally found to reside in its *essential Oil*.

THE better to ascertain the dose of *Opium*, as well as its effects, it should be considered as a thing of real moment to have its *extract pure*; this may be obtained by adding equal quantities of distilled water and pure spirit of wine, viz. twelve ounces in the whole, to one ounce of crude *Opium*; these being frequently agitated and digested in the sun, for six or seven days, will make a *strong Tincture* which may be filtered through paper and kept for use; or being placed in a broad flat vessel, by a very gentle heat, may be reduced to a *soft pure extract*. Of the above tincture, from twenty to sixty drops may be used occasionally; and of the Extract, from half a grain to one grain and a half, or more.

IT is here proper to remark, that, in plethoric habits of body, where the pulse is hard, full and frequent, the skin dry, the body costive, and the vessels of the head overcharged with blood, which may best be known by the inflammatory appearance of the Eyes; OPIATES ought not to be directed, *till Bleeding and Laxatives* have preceded. On the contrary, in
those

those of great sensibility who are subject to nervous disorders, or to painful and spasmodic affections; where the pulse is languid, unequal and loses its firmness; the power of OPIUM is almost divine: It will soothe the Nerves into a state of tranquillity, suspend the force of mental anguish, and bodily pain, and at last procure Sleep.

SPIRITUOUS cordials, with syrup of white Poppy, will be found the best substitutes for *Opium*, with those who have been accustomed to it; but, it will be necessary to diminish their quantity by degrees, and then wholly to omit them; instead of which five grains of *G. Assa fœtida* may be given occasionally in a pill, with the camphorated mixture. In this manner, I have prevailed on several totally to desist from *Opium*, who, I apprehended were much injured by its long and liberal use.

It may perhaps be said, that the most powerful medicines are obtained from the strong-

est Poisons. In some degree this may be true; but it ought to be remembered, it is their proper or improper use that constitutes the remedy or the poison; and consequently such dangerous substances should never be directed without judgement and prudent caution.

OF strong *Emetics*, and harsh, drastic *Purgatives*, it is sufficient to say, that their frequent use has been observed greatly to injure the *Stomach and Bowels*, to impair Digestion, and to render the body costive.

THOSE of tender bowels, or *weak Nerves*, suffer much from the violent agitation of *Emetics*, which invert the natural, expulsive motion of the intestinal canal, and occasion regurgitation of bile into the Stomach, contrary to its natural course downwards, attended with nausea and intolerable sickness. To such also as are of full habits of body, or who have *unsound Viscera* tending to inflammation; *Emetics* are dangerous, and have sometimes proved
fatal,

fatal, by increasing inflammation, or bursting a blood-vessel.

IN general, it may be right to encourage those discharges which nature seems to have set on-foot; but this rule is not without exception; for, every discharge is not *critical* or salutary, but on the contrary often *morbid* and spasmodic. It is too much the common practice to give an *Emetic*, wherever symptoms of *bile* appear at the stomach, without duly regarding the cause of its redundance; which, for the most part, is a *symptomatic* and not a *primary affection*; for, where bilious vomiting is present in cases of *nephritic Colic*, inflammation of the Stomach, plethoric disorders of the head, or a disposition to *Apoplexy*, which not unfrequently happen; *Emetics* will aggravate the disease, and render it more dangerous, or even *mortal*. Bleeding, plentiful dilution, and the warm bath, will be proper, and gentle Laxatives to carry off the offending bile by the intestines.

To suppose a disease *bilious*, because there is a discharge of *Bile*, is an exceptionable opinion which frequently leads to errors in practice; for daily experience informs us, that the simple efforts of the Stomach from *sea-sickness*, injuries of the brain, and other causes, may produce *bilious* vomiting, without redundancy of bile, or any depravity of that fluid indicating such state of the constitution as may properly be called *bilious*.

By *strong Purgatives* often repeated, the Intestines are robbed of their mucus and rendered tender, irritable, and subject to diarrhœa, and colic pains; especially after taking cold, errors in diet, or other accidental causes, which, in their natural, sound state, would have produced no such effects. Besides, by their long continued use, the body is deprived of nourishment, and the blood so much impoverished, that many instances might be brought to prove a *Dropsey*, *Consumption*, or other chronic diseases were the consequence.

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FROM the habitual use of *Purgatives*, as well as spirituous liquors, the bowels, will lose their villous coat or fine nervous lining, so as to become half *callous*, and at last insensible to the gentle stimulus of *bile* the purgative appointed by nature to quicken their motion; therefore, *costiveness* will be another bad consequence of their frequent use, which, like the abuse of *Opium* or spirituous liquors, oftener become necessary from bad *habit*, than any natural defect in the expulsive force of the alimentary tube.

STIMULATING Medicines, in their first effect, have been observed to relieve complaints of the Stomach, where the fibres are lax, and the circulation languid; and, in this manner, plasters with Myrrh, Camphor, and the warm spices, even when externally applied to the gastric region, have removed agues, and some nervous and hypochondriacal disorders; but such maladies have been relieved or perfectly cured by the Peruvian Bark, exercise, and fresh air, after stomachic bitters, and heating aromatics had been given in vain, or with aggravation of the symptoms. The
reason

reason is obvious; the first only act locally on the Stomach for a short time, like a cordial dram; the other operate permanently, on the general habit, especially when assisted by mild *alterative Medicines*; and by promoting a free, and equal distribution of blood through its vessels, support the natural secretions, and increase the vital powers of the Stomach, in common with other parts of the body.

SPICY *bitter Medicines* invigorate the nerves of the stomach and expel wind; so far they are productive of present relief in relaxed habits, or cold phlegmatic constitutions; but the debility and languor that succeed their frequent use, the feverish heat they occasion, with thirst, costiveness, and sometimes a fit of the piles, soon convince the patient, that, for momentary good, he must experience a lasting injury.

THUS to solicit a weak, enervated Stomach to the exertion of powers which it does not possess,

possess, are means not less rational than that of spurring a horse when his strength is exhausted. Such medicines by their local stimulus may excite an inordinate craving for food, but cannot properly be said to create a natural appetite. That can only be permanently restored by repairing the constitution, and increasing bodily strength, with which the powers of the Stomach correspond, and are intimately connected.

MODERATE Exercise in an open carriage, or on horseback, in *cool, dry, pure Air*, which, of all others, is most bracing, assisted by a strong infusion of *Peruvian Bark*, with *mineral Acids* and Steel, and afterwards the chalybeate waters of Islington, Tunbridge or Spa, with the use of a flesh-brush, and *cold Bath*, where the *Viscera are sound*, are the principal remedies to be depended upon for lasting relief, in *primary atonic weakness of the Stomach*.

ALL stimulating Medicines act as *sedatives*, that is, they diminish the vital power of the body, when their first effect is over; as appears evident

dent in *Opium*, *spirituous Liquors*, &c. and stimulants even when externally applied, as in blisters with *Cantharides*, produce a similar change, and have been observed to occasion sleep, when other means failed.

BITTERS, astringents, and aromatics are all of the *Tonic kind*; but practical experience clearly proves, that their liberal and long continued use is highly *pernicious*, and that thus administered they defeat the very purpose intended; for, after a certain time, they diminish the energy of the Stomach, and at last destroy the vital powers of the whole animal system.

THE truth of this observation has been fatally exemplified in the exhibition of the *Portland Powder*, so long and unjustly celebrated in curing the *Gout*; for, authors of the first eminence, whose authority is unquestionable, have remarked, that although several who took it were almost free from regular fits, they were nevertheless afterwards subject to the
most

most dangerous species of it, viz. *irregular, atonic Gout* which often proves fatal, by falling upon the *stomach and bowels* or other vital parts; and *Dr. Cullen* in his Lectures, has observed, that most of those who unfortunately persevered in its use, for the long space of time it was usually directed, were suddenly cut off by *Apoplexy*, or died of an *Asthma, Dropsy*, or *Palsy* from the weakness and diminished tone of the solids, brought on by that medicine, the ingredients of which are all of the *aromatic, and astringent, bitter kind*.

I shall here quote his own words, as his observation is applicable to the present occasion.

“ Not long ago, in England, the *Duke of Portland's Powder* came into great reputation. This powder, in the Duke of Portland himself, and in many others who used it, prevented the painful return of the Gout, and inflammation of the extremities, and thus seemed to cure the disease; but
 “ almost

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“ almost always with a considerable change
“ in the system and pernicious consequences.
“ I may venture to say, that ninety out of
“ an hundred, who have taken this Remedy,
“ in a year or two after, have been carried
“ off by *Apoplexy*, or some other mortal *Dis-*
“ *ease*. In Scotland, only twelve or thirteen
“ persons have taken this powder, and all
“ have done it with the above consequences. All this I mention from my own
“ knowledge. The Course of this Medicine
“ must be continued for *two years*, to pro-
“ duce the desired effect.”

“ Upon the reputation of this powder in
“ England, trial was also made of it in Hol-
“ land, and *Professor Gaubius* gives testimony,
“ of its having had the same bad effects. Such
“ is the state of facts, with regard to the
“ use of *Bitters*; from whence we see how
“ sparing ought to be their use in Stomach
“ Complaints.”

I have elsewhere observed that the human
body is sustained and kept alive by three
principal

principal powers, which, like the movements of a fine machine, co-operate and assist each other; namely, the Brain and Nerves, the Heart and Arteries, and the Stomach and Bowels. Those, with the action of the Lungs, constitute the very principles of life, and are the instruments of all sensation, circulation, and vital motion, and the very agents which govern and direct the whole animal machine; consequently, when any of them are disconcerted or put out of order, the functions of the body must be unduly performed, and ill health will ensue.

BUT, besides these powers, there is a more latent principle of life, called *Irritability*, which does not depend upon any of the former, but continues to exist in the body, after all sensation and circulation are lost, and every vital principle but itself extinguished and destroyed.—*Irritability* may therefore be defined, a property residing in the animal fibre, from the nature and peculiar structure of its parts, which upon being pinched or stimulated, is endowed with the
 faculty

faculty to contract and shorten, although the animal be dead; for the Heart which is the most irritable part may be excited to motion, after the head is separated from the body; hence this deduction may be made; that *Irritability* is *independant of both Sensibility and Circulation*; and as it is manifestly the first principle which gives commencement to animal life, so it seems the latest in taking leave of the body.

OBSERVATIONS made by the Microscope, and also anatomical Injections demonstrate, that all parts of the body are most vascular and elastic, in *Infancy*; and that from the simple effect of age, which hardens the animal fibre, and renders it more rigid and less elastic, as well as the effect of the blood's impulse upon the yeilding solids; many vessels, which at first, freely transmitted blood, are from thence condensed into solid fibres; this mechanical change in the constitution is gradual and progressive from infancy to old age; for when the *Mucus* or glue of which the solids are made up, becomes so firm as to lose
its

their sensibility and irritability; and that elasticity or re-action of the vascular system opposed to the Heart's motion, being less; the circulation will become languid, and a paralytic numbness, or apoplectic stagnation succeeding; the animal must necessarily die.

THIS apoplectic disposition prevails most in advanced age, when a *venous plethora* prevails, or to speak more intelligibly, when the blood impelled by the Heart through its arteries, is returned by the veins with greatest difficulty.

THAT natural process inherent in the human constitution, of increasing the cohesion of the solids, from the effect of age, is greatly augmented by various causes, of which the most powerful are intense Cold, Acids, ardent Spirits, and aromatic astringent *Bitters*; especially in advanced age, about that period of time when the constitution may be supposed most subject to *Gout*, and when the *Portland Powder* was usually administered; the pernicious effect of which concurring with the natural
I tendency

tendency of the habit in hardening the solids, contracting the vessels and rendering them impervious to the circulating blood, may with reason, be supposed so much to diminish the sensibility, and irritability of the corporeal system, and so greatly to impair its vital energy, as to hasten old Age, and put a premature period to human life.

IN proof of this natural tendency of the solids to rigidity, from the effect of Age, may be mentioned the *Ossification of Arteries*, or conversion of flexible blood-vessels into rigid bony canals which having no elasticity or reaction against the Heart's impulse; the circulation, in such parts, will consequently cease, and they must necessarily perish and die.

By having thus enquired into the state and condition of the body at different periods of its existence; and in what degree the vital power is most vigorously exerted from *Infancy to old Age*; we shall be better able to account for that *mechanical, morbid change* produced in the solids, by particular substances of the *stimulating, as-*
tringent,

tringent, bitter kind, like those of the *Portland Powder*; and how, they may occasion *Apo-plexy* and *Sudden Death*, or become mortal by stealing slowly upon the constitution in form of *Dropsy*, *Palsy*, or other chronic diseases.

FROM the preceding reasoning it is evident, that although *Tonics* may strengthen the body when judiciously directed, yet when given in excess, or too long continued, they counteract their own purpose, by diminishing its *irritability*, and *sensibility*, and consequently impair the vital power of the whole corporeal System; for, *the opposite extremes of tension and relaxation of the Solids*, are equally detrimental to a vigorous and healthy state of the human constitution.

I HAVE been more circumstantial on this subject, as the reasoning here adduced will not only apply to the destructive effects of *Portland Powder*, and such like stimulating compounds; but also to the *abuse of ardent Spirits*, and the *pernicious use of Opium* already mentioned, which I think have not hitherto been sufficiently pointed out or attended to.

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No Remedy has been more abused than that of *Bleeding* by the lancet, the preposterous use of which, therefore deserves consideration; for, blood being the fountain of life, the profuse or unseasonable discharge of it, will endanger the constitution by destroying that due balance which ought to subsist between the solids and fluids.

IN *acute Diseases*, where blood is redundant, bleeding is a speedy and efficacious remedy; but in *chronic* as well as acute *Maladies* of the putrid kind, when it rather offends in quality than quantity, the loss of blood is productive of great injury; particularly in those of lax solids, weak nerves, and bad *Digestion*. But should it, for particular reasons, be sometimes thought necessary in such cases; the advantages proposed by it, may be more safely obtained by spare diet, moderate exercise, and gentle laxatives, which will gradually empty the vessels, with much less diminution of strength.

THE frequent and unseasonable loss of blood, in those of a spongy habit and pale aspect, weakens the circulating power, and diminishes the natural secretions and excretions; it impairs digestion, disposes the body to corpulency, dropsy, and nervous disorders, and even convulsions, where blood is discharged suddenly and in great profusion.

If the patient, after bleeding, is affected with languor, flying pains, oppression, or sleepiness, he has then been greatly injured by it; for, in such, the circulation languishes, perspiration is lessened, and the *blood is not carried far enough through its vessels, to invigorate the system and support the natural secretions*; hence a load of gross humours will be accumulated, and a bloated habit of body will ensue; especially in those who indulge in eating, and use not sufficient exercise to carry off the redundant fluids.

ON the contrary, those of strong solids, a costive habit, and hard, full pulse, attended with giddiness and head-ache, or other symp-

toms of plenitude, may lose blood, use low diet, and keep the body laxative with great relief to the constitution; particularly, at new and full moon, *about the Vernal or Autumnal Equinox*; for at that period, *Apoplexies, Palsies*, and other fatal diseases most frequently happen. But, the indiscriminate loss of blood in *spring* and *autumn*, in such as are healthy, is a *vulgar error*, which has been injurious to many; since no alteration, for the better, can add to perfect health.

IN short, such as live temperately, use sufficient exercise, and perspire freely, will seldom have occasion to lose blood by the lancet, except in acute diseases where the circulating power is preternaturally increased by pain, fever, or other violent causes.

S E C T. V.

Of symptomatic or secondary Diseases of the VISCERA, proceeding from SCROPHULOUS, VENEREAL or SCORBUTIC ACRIMONY; from IRREGULAR GOUT, REDUNDANT BILE, or violent passions of the mind; also, from coſtiveness, external violence, worms, or other acceſſary cauſes.

IF the diſtinction between primary and ſecondary Diſeaſes of the Stomach, in this and the preceding Section, be not critically juſt, it will at leaſt afford the Reader ſuch a competent idea of their difference, as may be uſeful; and indeed, ſo great is the difficulty of tracing effects to their ſource, that what is ſuppoſed the original, or proximate cauſe of certain Diſeaſes, is often *ſecondary* or the effect of ſome other cauſe too remote for human diſcovery. In this Eſſay having nothing ſo much in view as utility, I have been leſs attentive to nice diſtinctions or ſyſtematic arrangement.

SCROPHULOUS, *venereal*, or *scorbutic matter*, or by falling on the Viscera, will interrupt, or destroy their natural functions and produce symptoms of great violence, which, by long continuance always injure health, and endanger the patient's life. To such affections, may be added others of the like symptomatic kind proceeding from *irregular gout*, *redundant bile*, or *violent passions of the mind*; all which diminish the energy of the visceral Organs, which cannot be restored until those morbid causes are removed, which thus *contaminate the blood*.

WE have remarked, that *stomachic Bitters*, and spirituous, cordial Medicines to which the patient has generally recourse, are so far from being serviceable in such cases, that their frequent use has been found injurious in a high degree; for all *stimulants* by long continuance counteract their own purpose, and produce *atonic effects*. By vellicating the coats of the Stomach, they excite a canine, or preternatural appetite which craves a greater quantity of food

food than the Stomach can digest or dispense with; so that, instead of being nourished, the patient will be oppressed with flatulence, palpitation of the heart, hectic heats, and such *chronic Diseases* as are consequent of ill-prepared crude Chyle, viz. *Gout*, *Dropfy*, or scorbutic Cachexy; for, it should ever be remembered that the body is not nourished in proportion to the quantity of food received into the Stomach, but according to the degree of perfection with which it is digested.

BESIDES, where the Viscera are affected from *constitutional causes* or a bad state of the blood, such medicines having *no alterative quality* or power to change the general habit of body, can produce no lasting, salutary effects.

IT is not here necessary to enter into a minute discussion respecting the difference of opinion whether the causes of *Chronic Diseases* are seated in the solids, or fluids of the animal body; but it may be proper to remark, that those causes when duly examined, are not so remote

remote from each other, as they at first appear from a superficial view.

IN infancy and youth, during bodily growth, the *fluids are converted into solids*; and in more advanced age, there is a constant supply of juices sent to the solids for their renovation, and repair; consequently, diseases originally existing in the fluids, will at length be transmitted to the solids, and completely disseminated through their several parts: Therefore, whether medicinal substances act on the one or other, or on both, it does not seem necessary to determine; since, either way, their effect may prove salutary.

THE *Scrophula* is a *Disease of the lymphatic glands*, confessedly *hereditary*; as may be proved from innumerable, and incontestible instances; but it may also be acquired, and is most frequent in young subjects of fair complexions, and lax solids.

SOME Authors have supposed that the proximate cause of this disease arises from a vitiated conformation

conformation of the lymphatic system; but others with more apparent reason, imagine it proceeds from a particular species of acrimony existing in the blood, and diffused through the lymphatic system.

THIS last opinion appears the most probable and consistent; because the disease is found to prevail most in infancy and youth when the quantity of fluids is largest in proportion to the rest of the body; and abates in more advanced age when those fluids gradually become less, and the solids more firm, about the age of puberty, in both sexes; when, in the one, the secretion of semen commences, and in the other, the periodical discharge; by which, some portion of the offending acrimony may perhaps be carried off. At least from this extraordinary change, a kind of revolution commences in the human constitution which seems to give it a temporary ascendancy over the disease; and therefore, this is the proper season to assist the efforts of nature, by the power of art, or in other words, to administer medicines to the best advantage.

BUT

BUT although the *Scrophula* is generally *hereditary*, it may also be adventitious, from all such causes as weaken the bodily habit; consequently, children badly nursed or improperly fed, or who from preceding illness, are unable to use sufficient exercise, are of all others, the most liable to this chronic weakness.

AFTER the *small-pox*, *measles*, or *hooping-cough*, especially when those acute diseases have been terminated by an *imperfect crisis*; Children are extremely apt to become rickety, or affected with scrophulous symptoms, which, then, if duly attended to, would generally admit of cure.

THE same soft, spongy habit of body disposes it to *Rickets* and *Scrophula*. The last is often the effect of the first; but, even when the *Scrophula* is *hereditary*, a rickety disposition may prove the exciting cause, and anticipate the disease.

I HAVE indeed observed that the two maladies are frequently complicated, and their morbid appearances after death, nearly the same; for, in both, the *mesenteric Glands* have been found inflamed, enlarged, and ulcerated; and the Lungs affected with *inflammation* and *tubercles*; particularly in *Scrophula*, which, if not removed in the beginning, often unfortunately produce an incurable, *pulmonary Consumption*, or universal wasting of the body called *Marasmus*.

A DECOCTION of *Taraxacum*, (dandelion root,) with the addition of *Sal polycrest*, or *fossil alkali*, may be given two or three times a day; lixiviated whey, with honey; and also the whites of fresh eggs may be taken with good effect if continued for a long time; but a more powerful deobstruent may be found in very small portions of *crude Mercury* minutely divided with gum arabic, and rendered palatable with syrup of orange peels. A vegetable Regimen of ripe fruits, and such roots as abound with a saponaceous quality will be proper,

per, as those on Endive, Lettuce, Scorzonera, &c. In the conclusion, Peruvian Bark, to an infusion of which the neutral Salts may be added, will be necessary to strengthen the habit.

SEA-WATER, or burnt sponge with a strong decoction of Colt's foot, sometimes afford relief in scrophulous disorders; and *Sea-bathing* where the *Lungs and Viscera are sound*, is a remedy of great efficacy; but several have been much injured who precipitately made use of it, without previous evacuation, or other preparation of the body.

RESPECTING *Venereal Complaints*, Dr. SWEDIAUR, in his excellent Observations, informs us, that in some parts of Italy, there is a *Law prohibiting the use of Mercury* in public Hospitals there, for curing the *Venereal Disease*. How then is it cured? by other means most assuredly; otherwise it would be an act of inhumanity as well as bad policy to forbid the use of so powerful a Remedy, if another more safe and efficacious was not to be found.

FROM

FROM this circumstance, it appears that the Physicians who preside over those Hospitals, entertain an opinion very different from many in this Metropolis, who suppose the venereal disease is only curable by Mercury. In this assertion they either trespass against their own judgement, or, in speaking their sentiments, confess themselves unacquainted with milder Remedies which have repeatedly, and incontestibly proved their efficacy in *eradicating the Disease*; but, I shall not trouble the Reader with Opinions which I have advanced elsewhere,* and which, for obvious reasons, might here appear exceptionable, as foreign to the present subject.

DR. SWEDIAUR speaking of other remedies, besides *Mercury*, for curing the *Lues*, expresses himself, as follows. “ Several remedies have
“ been recommended as succedaneums for
“ Mercury in the cure of venereal Disease,
“ which have been made use of for this pur-
“ pose,

* A Dissertation on the properties and efficacy of the LISBON DIET-DRINK, in the cure of the Venereal Disease, and Scurvy, &c.

“ pose, we are told, with success, before, or
“ since Mercury was introduced. Some, we
“ are credibly informed, are even at this time
“ actually employed with the best effect, in
“ South as well as North America, for cu-
“ ring the Venereal Disease radically without
“ Mercury.

“ WITH the Root of *Lobelia Syphilitica*,
“ as we are instructed by *Dr. Kalm*, and af-
“ terwards more exactly by *Mr. Bertram*, the
“ Inhabitants of North America cure the Ve-
“ nereal Disease as effectually as we do with
“ Mercury. My friend *Dr. Winter*, professor
“ of Botany at Buda in Hungary, discover-
“ ed, lately, that the inhabitants in the confines
“ of Turkey cured themselves of the Lues in all
“ its stages, by a decoction of the *Astragalus*
“ *exscapus*.”

WHOEVER doubts the efficacy of such Re-
medies, from their want of gravity with which
Mercury is endowed, need only attend to a
curious experiment to remove such ground-
less

less furnishes. Viz. the bones of animals, who have for some time eaten their food with a mixture of *Madder-root*, acquire a florid, red colour, even in their most solid and compact parts: This circumstance is remarked by the late *professor Monro*, in the following manner. “ The clearest demonstration of the intimate distribution of small arteries, is to observe the effect of such a tinging substance, as can retain its colour when swallowed, digested, and mixed with the blood of any living animal, and at the same time has particles small enough to be conveyed into the vessels of the bones; such is *RUBIA TINCTORUM*, *Madder-Root*;^{*} for we see the gradual advances which this tincture makes from the periosteum into the more internal parts of the bones, and how universally the distribution of liquors is made, the whole bony substance being tinged.”

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* *Philos. Transact.* Numb. 442, Art. 8. Numb. 443, Art. 2. Numb. 457, Art. 4. *Mem. d’Acad. des Sciences*, 1739, 1743.

HENCE it is evident that all parts of the body, even the bones themselves, abound with vessels infinitely small, and are pervious to the subtile particles of medicinal substances, which, with the blood strongly impregnated by their virtues, may be transmitted to the diseased parts in such manner as to effect a perfect cure without injury to the constitution.

MERCURY is extremely improper, where the *Venereal Lues* is complicated with *Gout or Scurvy*; for, both these diseases have been found, by experience, to be aggravated by its use. It is also improper where the venereal disease is combined with *Scrophula* or Leprosy: In such cases, the symptoms, although alleviated for a time, returned after its use, with more severity than before; yet it still continues indiscriminately to be directed; and so dangerous is that mistake, of rating the patients safety by the quantity of mercury administered, that it has been destructive to the constitution of thousands.

THE Mercury-miners are always short-lived,* for in a few months they begin to tremble and scarcely any of them live to the third year: Also according to *Ramazini*,† from the authority of several writers, they die miserably, being affected with *Palsies*, *Vertigo*, and *hectic Fever*.

BACKSTROM, a Dutch Physician, together with *Hoffman*, both condemn the use of Mercury in the *Scurvy*, and *Etmuller* observes it is so pernicious in that disease, that the Dutch abstain from it even in *Venereal Cases*, lest they should be complicated with it.

‡ KRAMER also informs us, that four hundred of the Imperial troops in *Hungary*, near *Belgrade*, who took *Mercury* without his advice, died by the fatal consequences of a Salivation, with the *loss of their Teeth and Gums*.

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* Fallop. Tract. de Metall. et Fossilibus.

† De Morb. Art.

‡ Kramerii Dissert. Epistol. de Scorbuto.

IN all cases, therefore, of *scrophulous*, and *scorbutic acrimony*, or a *venereal taint*, which like the *Scrophula* often falls upon the lungs, and occasions a *Consumption*; it will be necessary to have recourse to such *alterative Medicines* as tend to correct, and have the power to evacuate the offending humours; for, if the *Cold Bath* or *Tonics* should be incautiously directed in such cases; by bracing the solids, they would not only concentrate and lock up the cause of such diseases, but by repelling the blood to the weak internal parts, might greatly endanger the constitution.

THE cause of Gout and Scrophula has long been supposed to reside in the blood and juices, but, of late, this opinion has, by some few, been set aside and another adopted, viz. that it originates from *vitiated stamina*, and not from a morbid state of the fluids.

IN support of this new Theory, we are told, that the *Scrophula* is not an infectious disease; its morbid matter not being exhaled by perspirable fluid on the surface of the body; a
presumption,

presumption, that it did not reside in the fluids; but in the solid system.

THAT the disease is not infectious, is not to be disputed; but this proves nothing respecting the new opinion to be established; for, the Venereal Infection confessedly lodged in the fluids, is equally incapable of being communicated by effluvia, as the Scrophula itself.

IT has also been asserted, that there is no proof of morbid matter in the fluids, being the cause of Gout; or that such cause is always present in the constitution.

THAT the cause of Gout is always present in the constitution, is *incontestibly proved* from the following well-known fact; namely, that hæreditary gout is transmitted from the father to his offspring, and from thence to succeeding generations.

BUT although the cause of those diseases should exist in the solids; seeing that the diffe-

rent qualities of our fluids chiefly depend on the peculiar dispositions of their strainers, they would from thence, like the solids, soon become vitiated and concur with the former cause in aggravating the disease; as we have observed, that the fluids of the body are constantly converted into solids.

BUT general, and accurate observations established upon repeated, practical facts, need little argument for their support, when opposed to specious conjectures and surmises resting upon individual authority; and we only desire to remark; that the sudden relief produced by *critical Eruptions*, and the bad consequences of repelling them; the copious sediment in the urine of *Arthritics*, and the chalk-stones frequently deposited in their joints, all incontestibly prove, that the gouty matter, whatever it is, *resides in the fluids and not in the solids of the body*. Respecting the *Scrophula*, the enlargement and ulceration of the glands, the discharge of sharp, corroding humour from the sores, attended with *inflammation of the Eyes*, and excoriation of the cheeks, clearly indicate

dicating the existence of acrimony in the blood and juices, and are so many effects of that evident cause.

THE limits of this Essay will not permit me to enter into a minute discussion of the various opinions which have prevailed respecting the cause or essence of *Gout*; it will only be necessary to speak of the disease in its *irregular state*, which happens more frequently than that terminated by regular fits; and when severe, is attended with much greater danger; for, instead of fixing like the former upon the extremities of the body, it often retreats to the vital parts, particularly, the *Stomach and Bowels*, where if neglected, or improperly treated, it frequently becomes fatal. However, before we proceed to lay down *Rules and Cautions* for the observance of those who are subject to this *irregular* malady; if we may hazard a conjecture, the most probable *cause of Gout* seems to be, the *retention of rigid, earthy particles* taken into the body with aliment, which it is sometimes unable either to expel by the excretions, or subdue by its circulating power.

THE asperity of those particles, may easily be conceived to occasion exquisite pain, by vellicating and wounding the tender solids where they are deposited. When collected in the joints of *arthritics*, in form of chalk-stones, they appear to be of the same nature with those found in the bladder; so that a disposition to form gravel in the kidneys, seems nearly allied to a gouty constitution; for gouty patients, in the decline of life, are observed to be extremely subject to the Stone and Gravel.

WATER contains a considerable quantity of this fabulous, earthy matter, as appears by the stony incrustation adhering to the inside of old water-pipes, tea-kettles, and other utensils long used in boiling water.

Most Wines abound with *Tartar* difficult of solution in water; but whether this saline concrete taken into the human body, and there remaining unaltered by its assimilating power, be the cause of Gout, as many have supposed, it is not easy to determine; although the fact is
certain,

certain, that those addicted to the immoderate use of Wine, are of all others most subject to that disease; and on the contrary, others who have confined themselves to water-drinking, or malt liquors, are seldom affected with it.

CYPRIANUS, the celebrated Lithotomist, asserts, that among many hundreds he had cut for the stone in the bladder, he never met with one who had constantly drank *Ale or Beer*; and indeed, such as abstain from Wine, and drink those liquors, are seldom afflicted with Gout.

THE *irregular or anomalous Gout* diffused over the habit, by some also called *atonic, suspended, or internal Gout*, is difficult to be distinguished from other diseases, as it often resembles those peculiar to certain parts of the body, and from which *none are perfectly free*; but, of all others, it is most apt to visit the *Stomach and Viscera*, where it occasions loss of appetite, indigestion, with excessive flatulence, and sometimes vomiting; also colic pains, diarrhœa, and profusion of bile. When it attacks the head, it is attended with pain, giddiness, loss of memory,

memory, and even Apoplexy, especially in the decline of life. If it falls upon the Lungs, it produces difficulty of breathing resembling Asthma; if on the Brain and Nerves, it is followed by dejection of spirits, or melancholy. A palsy of the lower extremities has also been the consequence, especially if it is attended with *Lumbago* or violent pain in the loins, which is not confined to Rheumatism, but is also a symptom of this *Proteus-like disease*, which sometimes suddenly shifts from the back to the stomach.

THOSE who are subject to *Gout*, whether regular or irregular, are commonly visited by it in the *Autumn*, or *Spring* which is the more favorable season; for, that being succeeded by a warm summer which opens the pores, and allows the gouty matter to transpire, the disease is rendered less violent.

WHEN the powers of nature languish, and are either insufficient to produce a regular fit, or where, from the effect of age, there is not strength of constitution to throw gouty matter upon the extremities of the body; then
there

there is great danger of its retreating to the internal, vital parts, where it produces nausea and sickness, loss of strength, attended with darting pains, uncommon tenderness of the feet, and irksome, unpleasurable feelings: The patient is low-spirited, peevish, impatient, and disturbed by the most trifling, accidental causes.

IN this situation, he is also frequently troubled with the *Arthritic Colic* or gouty twinges in the bowels; sometimes with weight and oppression of the breast; particularly, after anxiety of mind, or exposing his body to easterly winds, or night air. Such symptoms of irregular Gout are always attended with great danger; especially, in broken constitutions which have suffered from intemperance or other causes.

THIS gouty affection of the bowels is often attended with a *diarrhœa*, which if moderate and succeeded by abatement of pain, with a return of appetite, and natural rest, is a critical discharge, and ought not to be stopped. On the contrary, where the symptoms are violent; with

with pain, sickness and bilious vomiting accompanied by fever; Opiates, Aromatics, and Cordials should immediately be administered, or the disease may put a period to the patient's life. A strong infusion of *Mint* in warm spiced Claret will be proper; aromatic fomentations should be applied to the stomach and belly, and warm opiate clysters injected; but above all things, the *camphorated mixture with tincture of Opium* should be liberally administered.

THE *Arthritic Vertigo* or swimming in the head, with which the Stomach holds sympathy, is equally dangerous, and one of the most alarming symptoms of irregular Gout; for, if it is not speedily relieved by proper means, or by a regular fit, it frequently terminates fatally in *Apoplexy*. The following symptoms denote this dangerous malady: The face is turgid, and of a more livid hue than usual; the eyes are blood-shot, the tongue falters, the memory fails, the steps are unequal and staggering, and the patient cannot hold down his head, or quickly turn round, without the danger of falling on the ground.

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IN *irregular Gout*, the intention of cure will be, to expel the gouty matter from the internal, vital parts, and to *invigorate and fortify the Stomach and Bowels* in particular. For this purpose, the *camphorated mixture*, with the addition of *Hoffman's anodyne liquor*, and occasionally the *tinctures of Antimony, and Opium*, are superior to all other medicines, and properly directed, will, in a manner, render the rest unnecessary.

WHERE the stomach becomes *torpid*, and insensible from a gouty attack, and affected with symptoms of great violence; warm Madeira wine, spiced claret, or even the *volatile, aromatic Spirit*, in Ginger or Pimento tea, will be proper. Bottles of warm-water, wrapped in flannel, should be put to the soles of the feet, and carded wool, or fleecy hosiery applied warm to the pit of the stomach and abdomen.

IN such urgent cases, I have directed the following medicine, and frequently with very speedy and extraordinary relief to the patient.

TAKE

TAKE of the Camphorated Mixture of the new, London Dispensatory, eight ounces; Hoffman's Anodyne Liquor, two drams; tincture of Opium, one dram.

THIS mixture may be taken in the quantity of a tea-cup full, every three or four hours, or as often as the nature of the symptoms require; it will warm and invigorate the nerves of the stomach, expel wind, and abate pain.

SHOULD the violence of pain threaten inflammation of the *bowels*; Blisters should be applied without delay to the inside of the legs, and arms, and the patient should lose blood, in quantity proportioned to the urgency of the symptoms.

IF the body be costive, ten grains of fine *Rhubarb*, in powder, may be given occasionally, with half a dram of aromatic Confection, till it gently opens the bowels; and when the stomach is greatly oppressed with bile, flatulence, or a load of crude humours; an infusion of Horse-raddish or mustard-seed may be drunk copiously, till the Stomach rejects it and is thoroughly cleansed.

EMETICS,

EMETICS, by the efforts of vomiting, though objected to by some, and with great reason, where there is tendency in the Stomach and Bowels to *inflammation*, or where the vessels of the brain are overcharged with blood; will, notwithstanding, often produce a good effect, after bleeding, by dislodging Gout from the Stomach and expelling it to the extremities of the body. This seems to be brought about, by their powerful stimulus, and the consequent agitation of the whole *abdominal Viscera*, by which, a larger quantity of blood is driven to the surface, and the pores of the skin are forced open; hence, by a *change of circulation*, the *seat of the disease may also be happily changed*.

WHEN Cramps or Spasms affect the legs, or should an inflammatory swelling on the feet supervene the symptoms of irregular Gout, with abatement of the disease; it is a good sign, and fortels a favourable event. It may then be proper to invite the gouty matter to the extremities by putting the feet in warm-water, which will relax the skin and open the pores. If the
inflamed

inflamed part is attended with much pain or a considerable degree of fever; Leeches may be applied; the camphorated mixture, with the addition of Manna, may be occasionally taken, to render the body laxative; and the patient should be kept in a gentle perspiration, by remaining still and quiet in bed, leaving the rest to nature.

WHERE this Gouty disposition is complicated with a *scrophulous*, *scorbutic*, or *venereal taint*, its symptoms are extremely anomalous and diversified: Sometimes eruptions appear on the body and limbs, preceded by wandering pains, head-ache, and hectic fever; with cramp or spasmodic twitches of the muscular parts.

WHATEVER causes weaken the vital power of the body, or suspends its natural secretions or excretions, will subject the patient to this fluctuating disease; and therefore, it is often the consequence of long continued chronic ailments, anxiety of mind, or much bodily fatigue; intense study, intemperance or a sedentary, monastic life: To these may be added, excessive
Venery,

Venery, a Salivation, or the *immoderate use of Mercury*; but whatever may be the cause, observation affords convincing proofs, that where this disease has proved fatal, many have been destroyed by improper treatment, from their own indiscretion; namely, by volatile liniments and spirituous applications, errors in diet, or cold air acting with violence on the surface of the body, by which the gouty matter has been repelled and driven inward upon the vital parts.

ALTHOUGH the *Scurvy* is a disease which does not so much affect the stomach, as the general habit; nevertheless, it sometimes produces *obstructions of the abdominal Viscera* which are followed by jaundice, dropsy or a bloated state of the solids, attended with evident signs of the highest putrefaction; also violent pains in the belly, with dysentery, or a discharge of corrupted blood by stool.

THE distinction of land and sea scurvy is without just foundation, and it is now almost universally allowed by the best writers that there is only one species of that disease; its proxi-

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mate

mate causes being always the same, viz. cold, moist air, salted, indigestible, putrescent food; and such other exciting causes as diminish the vital powers of the body; namely, anxiety of mind, over-fatigue, the unfavourable crisis of acute diseases, or the long continuance of such as are chronical. Its several symptoms seem to arise from different degrees of the disease, variety of climate, and the difference of constitution upon which its causes operate.

THERE is no disease more fallacious and uncertain in its event, or more unaccountable in some of its symptoms, than the Scurvy; many of those whose appetite for food remained unimpaired and perfect to the last, and without complaining much of any thing but loss of strength; from sudden motion of the body, or change of air, have unexpectedly been seized with fainting fits, and presently expired.

THAT the stomach, even in its depraved state, should still preserve the faculty of craving food, in the most inveterate degree of *scurvy*,

vy, even when the blood and juices are manifestly corrupt, and the body almost falling to pieces by a putrid dissolution, is a circumstance, worthy of remark, equally extraordinary and unaccountable; particularly, when we consider the opposite effect produced on that organ, by sudden *grief or anxiety of mind*, where both appetite and digestion are instantly taken away, although the solids and fluids remain sound and intire. So extraordinary are the changes produced upon the animal body, from causes, which seem inadequate to their effects, or where the effects imply causes which are beyond the reach of our comprehension.

As it has been allowed that cold, moist air is productive of scurvy, so it has been experimentally found, that a dry, temperate atmosphere, warm clothing and flannels worn next the skin, with moderate exercise, which promote perspiration; will powerfully contribute to its relief and cure. But, although the use of much salted putrescent animal food has always been deemed a principal cause of the disease;

whether the morbid effects are produced simply by *salt*, or its rendering animal substances indigestible, or from their being putrid, are questions which still remain in dispute among physicians. Be this as it may, it is certain, that plenty of pure water, fermented liquors, ripe, acescent fruits, and succulent, green vegetables, or even a few cabbages cut fresh from their stalks, and liberally used by the patient for food, will contribute more to his cure than all the medicines in the *Materia Medica*.

Thus the nature and treatment of *Scrophula*, *venereal Lues*, the *irregular Gout* and *Scurvy* have been considered in a concise and general way; the limits of this short Essay not allowing of farther discussion, than what merely regards their morbid effects upon the *Stomach and Viscera*. Respecting such disorders as arise from *redundant Bile*, and their remedies, they have been mentioned at page 13, in a manner sufficient to shew how far the *Stomach and Bowels* may suffer by its depravity or excess, and will be farther considered in the
sixth

sixth section of this Essay on the *Morbid Affections of the Liver*.

THE *violent Passions of the Mind*, and their pernicious effects on the functions of the Stomach, have been particularly remarked in the third section of this Essay; and, it is here only necessary to specify, that when loss of appetite, and digestion are the consequence of such impressions, nothing will so much tend to restore them, as *cheerful company and travelling*, which, by continually shifting the scene, will divert the mind and call off its attention from the cause of its distress; which, if not seasonably removed, is often terminated by low spirits, and fixed *melancholy*.

To such, retirement and rest of body which they desire, are destructive; for, whilst they remain unemployed, they become a prey to their own painful reflections, and are cast down by the sad, and sickly sensations of a desponding mind. On the contrary, *exercise*, the conversation of affectionate friends, and music,

will all be highly beneficial. In a word, by agitation of body, and a variety of objects presenting to the mind, it will experience new impressions, and consequent ideas contributing to dispossess it of those it entertained before.

SINCE we find, that painful sensations of the mind will destroy health, occasion melancholy and diseases of the nervous kind; by parity of reasoning, it may be concluded, that pleasurable feelings of a contrary nature, will bid fair to restore it, especially when assisted by proper and powerful medicines, viz. preparations of *Péruvian Bark*, *Chalybeates*, and the *Cold Bath*.

IT is not easy to comprehend the train of evils brought upon the constitution by HABITUAL COSTIVENESS, except by those who have experienced its oppressive effects.

THE *Stomach and Bowels* cannot be distended beyond a certain degree, without creating pain; but, that will be different, at different times, according to the *sensibility* and *irritability* then existing in the habit of body; thus, when preternaturally

ternaturally tender, irritable, or inflamed; wind, or *ingesta* which, put them upon the stretch, will occasion intolerable pain, sickness, and oppression, which, in their sound state would produce no such bad effects.

THE retention of fœces longer than is natural, by distending the alimentary tube, will weaken its fibres, and from the pressure it occasions on the contiguous viscera, obstruct the circulation, and prevent that free and equal distribution of blood through their several vessels which is necessary to support the secretions and maintain health. Those which are most vascular, and sustain the greatest pressure, by interruption of their functions, will suffer most; namely, the Stomach, Liver and Mesentery. From the same cause, the blood being obstructed in the inferior vessels; those sent to the superior parts will be overcharged with it, and the head affected with pain, stupor, or giddiness, confusion of ideas, and loss of memory.

THE Stomach in particular is greatly injured by *Costiveness*; for, when the alimentary tube,

proceeding from it, is thereby obstructed, it will necessarily be oppressed and deficient in its office; hence, want of appetite and digestion, attended with sickness or vomiting; and frequently the hæmorrhoids or piles.

A COSTIVE habit of body may proceed from various causes, viz. from *a defect, or obstruction of Bile*, or its not being sufficiently exalted to stimulate the intestines, and quicken their expulsive motion; from the liberal use of *Opium* which diminishes their irritability and suspends their power; or from the abuse of *sudorifics, and drastic purgatives* which rob the intestines of their natural moisture; or *astringents* and spirituous liquors which contract their vessels and lock it up.

IN constipation of the bowels from want of bile, or where it is too thin and watery; the herb *Fumitory* infused in runnet whey, with a small portion of lixivial salt, will be found an effectual medicine; but in those of cold phlegmatic constitutions; equal parts of almond *soap and aloes* may be taken in pills with more advantage.

Where

Where there is thirst, and fever; a solution of the *Crystals of Tartar, with a sixth part of Borax*, in the proportion of one ounce in the whole, to a quart of pure water sweetened with manna or honey to render it palatable, I have found a most grateful and efficacious, neutral laxative; it is not only gently solutive, but also promotes the urinary discharge, abates febrile heat, and resists putrefaction.

IN those of plethoric habits, affected with head-ache or nausea at stomach; the saline draughts will be most proper; and diet of a cooling, laxative quality should be used by the patient; as that with stewed red cabbage, or beet-root, ripe fruits, new figs or raisins; runnet whey with honey, fresh wort, soft ale, &c. to which may be added, Seltzer water for common drink.

THERE is another species of habitual Costiveness which has been little attended to, and which requires a very different method of treatment. This arises from a weak, debilitated
state

state of the bowels, and their want of sufficient expulsive power to discharge their contents. Those who are advanced in life, and much reduced in strength by preceding illness, are the most subject to this malady; in the cure of which, I have found large and repeated doses of the *Peruvian Bark with a fourth part of crude Tartar* an effectual remedy given in the form of an electuary, with syrup of roses. It seems to act by giving more strength and firmness to the fibres of the intestinal canal.

WHEN the bowels are weak and inactive; rising more early in the morning, exercise, the flesh-brush and cold bath will be found beneficial.

To preserve the body in the due exercise of its functions; every one who eats plentifully, should generally have two motions each day; and the great Mr. Lock, in his treatise on education, points out the necessity of this intestinal evacuation as greatly contributing to health; towards which it will, therefore, be proper for every one, night and morning, to solicit the call of nature, till it becomes a constant habit; by
which

which means he will in a great measure, avoid the inconvenience of costiveness, and all its disagreeable consequences.

HABITUAL DIARRHOEA occasioned by grief or distress of mind, by some *deemed incurable*, is a disorder of the bowels directly opposite to the former. This complaint seems plainly to be an *atonic affection* of the bowels, and to proceed from diminution of their nervous power, as well as from obstructed perspiration which generally attends it. I am convinced, by experience, that constant exercise on horseback, and taking pleasant journeys, with chearful company, in an open carriage, and dry, pure air, where new objects strike the eye, and engage the attention, with the use of a flesh-brush, and flannel worn next the skin, will always relieve, and often perfectly cure this obstinate disease. If the patient has not natural rest, it will be proper to direct the *Camphorated Mixture, with Tincture of Opium and Antimony*, which will invigorate the nerves, promote perspiration, and procure sleep.

THERE

THERE are certain occupations in life which particularly subject men to *Diseases of the Viscera*, from painful pressure and long-continued positions of the body, which, from custom, they are not sufficiently sensible of.

STUDIOUS persons, who are usually inactive, by too much rest of body, and intense exercise of mind, become weak, *enervated*, and *hypochondriacal*: The stomach loses its digestive faculty, and the head is afflicted with a giddiness and stupor. By the sedentary state of the body, compression of the Viscera, and want of perspiration; many *Disorders of the Stomach and Bowels* are brought on. The secretion of bile in the liver is thus prevented, and its passage into the intestines retarded; whence proceed, *Costiveness*, and *Piles*, the formation of *calculous concretions* or *Gall-Stones*, and *obstruction of the mesenteric Glands*.

THOSE in particular, employed in counting-houses, of which, in this vast metropolis, there are very many, contract the pernicious habit of
resting

resting the weight of their breast against a table or writing-desk, the body at the same time being half double. This external violence, with the impure air they breathe in such confined places, has, in a thousand instances, been the evident cause of *consumption*, and *visceral diseases*, especially of the lungs, the stomach and liver, which no medicine could remove, whilst their cause continued, and which therefore have frequently had a fatal termination.

BUT, the dangerous consequence of external pressure on the abdominal Viscera may be more fully demonstrated by observing the effect of *tight Lacing* in the female sex; a custom so prevailing, though unnatural and pernicious, that it requires the most serious consideration.

By the violent, mechanical pressure of *narrow Stays*, or *tight lacing*, the *internal vital organs* will be *partially displaced*, and the body thrown out of its natural direction; consequently distortion will ensue, particularly in young subjects, who are in a growing state. Under such circumstances, the whole abdominal Viscera

cera being compressed, especially the *Stomach, Liver, and Mesentery*; the circulation of blood through their numerous vessels being thereby obstructed; *the due performance of their vital functions will be prevented, without which, neither health or life can long subsist.*

THE violence of such pressure will also change the course of the blood; and, by strangulating the exterior vessels, those internally will be overcharged with a redundant quantity: Hence, the more delicate parts, viz. the brain and lungs, being distended and inflamed; the patient will be affected with stupor, and headache, difficulty of breathing, and a strong, feverish breath.

THE constriction of tight ligatures round the waist will also prevent the heart, which is the principal agent of circulation, from discharging its blood, by the arteries, for the nourishment of the body; or its being freely returned by the veins; and from this cause will proceed oppression and palpitation of the heart, fainting,

fainting, swelling of the legs, *fluor albus*, and profuse periodical discharge; obstruction of the lymphatic vessels, and mesenteric glands; inflammation of the lungs, and spitting of blood; frequently terminated by an *incurable Consumption*.

IN a word, this preposterous and pernicious custom, which prevails more or less, as fashion points the way, disfigures the body, destroys the natural ease and elegance of the shape, and has been the cause of bringing many of the female sex to an untimely grave.

ALMOST innumerable are complaints of the *Bowels* arising from *Worms*, to which women are more subject than men, from the same cause, that children are more troubled with them than either, viz. a weak, inactive state of the stomach, and the want of sufficient digestive power to destroy the *ova* or eggs of those reptiles, when first deposited there.

WORMS are chiefly of three kinds, namely, *Ascarides* or small white Worms, which are generally confined to the *Rectum* contiguous to the

the fundament; the long, round Worms or *Teres* which infest the small guts and stomach; and the *Tenia* or Tape-worm, more dangerous than all the rest.

THERE is no disease of the *Stomach and Bowels* where information is more necessary than in that proceeding from *Worms*; either respecting the symptoms denoting their presence, or the means by which they may certainly be destroyed; more especially, as their existence in the human body is much more frequent than is generally imagined, and often the unsuspected cause of symptoms imputed to other diseases.

THOSE intestine enemies, particularly the *Tenia lata* or tape-worm, more destructive than all the other verminous species, not only feed on the chyle, and deprive the body of nourishment, but also gnaw and vellicate the fine, nervous lining of the intestines, and occasion symptoms so violent and extraordinary, as in the days of ignorance and superstition, to have made it suspected the patient was under the influence of *Witchcraft*.

WORMS

WORMS, if not totally destroyed, will soon renew their breed. This is best prevented by mixing purgative medicines with *anthelmintics*, which will deaden their power, and expel them from the body, before they have time to revive; especially, if they are continued for a considerable time.

THE more effectually to prevent them from generating again, it will also be proper to *strengthen the stomach and bowels* with chalybeat bitter wine; a strong infusion of Peruvian bark; or by directing the use of *Lime-water*. The patient should now and then drink a glass of generous wine, such as red Port, Madeira, or old Hock.

Æthiops mineral, a composition of mercury and flowers of sulphur, is not so efficacious as mercury divided with conserve of roses. For, in the first preparation, mercury by being united with sulphur, becomes fixed and inactive; so that if worms are destroyed by this medicine, it seems more owing to the sulphur. And indeed, the efficacy of Harrow-

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gate

gate water, which is strongly impregnated with sulphur, shews its extraordinary power in such cases.

DEAD worms, with abundance of mucus, have sometimes been evacuated after *malignant fevers*; a proof, that excessive corruption in the juices of the body then prevailed.

THIS *mucus* is not the cause but effect of those vermin; being only the glue of the intestines, immoderately discharged, in consequence of their painful stimulus, similar to that from the nose, occasioned by snuff, or the thick, ropy fluid voided with urine, from irritation of a stone in the bladder; but such mucus seems to afford them a proper *Nidus* or hatching-place.

IT is a mortifying circumstance that worms are not confined to the bowels, but sometimes have their residence in the *Liver*, and other parts of the body, even in its solid substance. I once attended a gentleman, then just returned

ed from *Guinea*, in whose legs were found small worms, resembling a fine white fiddle-string.

LIVID pimples, attended with violent itching, appeared in several parts of his legs and thighs, which being broken, this extraordinary worm came forth, and being secured upon a piece of twisted paper, was gradually rolled up every day, till the whole, of a vast length, was extracted.

A CASE of this kind is mentioned by Dr. *Mead* in his medical cautions. He describes the worm as an aquatic insect, with a sharp head and slender body, which works itself into the flesh of those bathing in the water, and is most commonly found in Africa and the East-Indies. This worm (*Dracunculus*) is also particularly mentioned by *Avicenna*.

NEGRO-SLAVES who feed grossly, and chiefly upon vegetables, are more subject to worms than the *whites*; as are also the children of common people in this country, who eat large quanti-

ties of fruit in Autumn, especially those fallen from trees and remaining long on the ground, where *Insects* perforate such decayed vegetable substances and *deposit their Eggs*, as in a proper hatching-place. Green peas, nuts, and many garden-fruits, particularly *raspberries* are full of maggots; but although we shall hereafter remark the permanent, and powerful energy of the *vital principle*; whether they are subdued by the digestive faculty of the stomach, or brought to maturity in the intestines, is a question not easily answered.

As three sorts of worms have been found in the human body, and each of those being a distinct species, namely *Ascarides*, *Teres*, and *Tænia*; it may be asked, how they are generated, or by what means they get there? Which of them are *oviparous*, *viviparous*, or like the *Polypus* produce their species in a more anomalous manner? What are the particular sorts of Reptiles which having severally deposited their ova, or *vermiparous* rudiments in the stomach

mach or intestines produce the three distinct species of *Ascarides*, *Teres*, or *Tænia*?

THESE queries being truly answered from *experimental facts*, and not from conjectures or surmises, would afford the best and surest means of avoiding their bad consequences; by pointing out those very animals which produced them, and also the very alimentary substances by which their rudiments found admittance into the human body.

ARE *Teres* or round worms of the same species as the common earth-worm which they nearly resemble, and are by *Linnaeus* included under the *same genus*? And is the small difference of appearance owing to their difference of food, and place of residence within the living body?

ARE infants subject to worms during the time of their being suckled at the breast?

HAVE worms ever been found in the stomach or intestines of still-born infants?

THE *general symptoms of worms* are, a wan sickly countenance, itching of the nose and swelling of the upper lip; the appetite is voracious at one time, and deficient at another, attended with pinchings in the bowels, tumefaction of the belly, and loose, pale, mucous stools, although at particular times, the body is uncommonly *costive*: The pulse is generally very irregular, the breath offensive, attended with a short, dry cough, startings in the sleep, faintings, and sometimes loss of speech, or convulsions; especially in cases of *Tænia lata* and *Tænia cucurbitina* which are both of the tape-worm kind. These general symptoms are often attended with the most painful sensations of the stomach and bowels, and, if not soon relieved, with universal weakness and wasting of the body, or that species of consumption called *Marasmus*.

It cannot now be wondered at, as before, that the tape-worm is with so much difficulty destroyed, since it has been discovered to possess the extraordinary power of *reproduction*,
similar

similar to that of the *Polypus*; so that if any fragment of it remains, *it will regenerate and each portion become a distinct worm* continuing to torment and keep possession of the body.

SINCE these are the symptoms of the *Tænia* as well as some others of the verminous species; what shall be said of the opinion which some have adopted, that worms may remain in the intestines without injury; nay more, that in young subjects, they are rather of service, by consuming the superfluous crudities with which their bowels are loaded? If this supposition be true, we may then, for the same reason, conclude, that a cabbage will thrive better when it swarms with caterpillars. Should such extravagant assertions deserve a serious reply, we need only mention the observation of practical writers, who have mentioned cases, where worms, like *Leeches*, by their close attachment to the intestines, had perforated their coats and were found in the cavity of the abdomen: This circumstance has also happened

in quadrupedes, of which, a medical gentleman assures me he saw an instance at Minorca, in a small, Spanish horse, destroyed by those vermin, where the guts were actually gnawed through, and the worms (Botts) had made their way into the belly.

THUS we may see with surprise, that some animals are produced in a manner very singular and *anomalous*, as I have elsewhere observed more at large.* A *Polypus* cut into parts, will generate so many distinct Polypi: How strangely different then is the effect of the same cause in animals of different species, since the division which destroys animal bodies in general, tends to reproduce and multiply that of a *Polypus*!

THIS extraordinary creature may be considered as an *intermediate link* to the different orders of animal and vegetable bodies; for, the sensitive faculty of the first, may be perceived to descend gradually in the scale of animal

* Lecture introductory to the Science of Midwifery; quarto, page 12.

nimal beings, till it dwindles into the inanimate growth of plants. As nature insensibly drops the animal process, she begins to play the wanton, and transgress her own laws. Thus *snails and earth-worms*, according to *Swammerdam*, are all of the hermaphrodite kind, and whilst they impregnate are reciprocally impregnated; and that uncommon reptile the *Surinam toad* does not produce its young from the interior parts of its body, like other animals, but from certain cups or sockets upon its back.

THE *Abbé Spallanzani*, as well as *Réaumur*, have observed, that this property is not peculiar to the *Polypus*; for, they have discovered that *Earth worms*, cut in peices, and some other animals, are endowed with the same faculty of *reproduction*; which I have had the satisfaction to confirm, in the first, by some experiments which came under my own observation. The same author asserts that the heads of land-snails, and legs of young frogs, are regenerated in the like wonderful manner; and farther, that upon the most accurate examination,

nation, they are found to differ in nothing from those parts in their original state. In such strange deviations from the stated law of nature, though our senses give evidence, we can hardly assent to their reality.

THESE extraordinary and well-established facts, however, enlarge our ideas, and extend the limits of natural knowledge, demonstrating, at the same time, the vast activity, and *permanent energy of the vital principle*, which, in vegetables, as well as animals, is remarkably prevalent; for trees cut down, or torn up by the roots, after their limbs have been lopped off, still retain their vegetative principle, by the power of absorption, and in so high a degree, as to throw out vigorous shoots or branches from the trunk though apparently dead.

LESSER, in his *Testaceo-theologia*, asserts, that the *Balani Marini*, *rock-muscles*, and *Oysters*, are not only *hermaphrodites*, but such as without any concurrence with each other have within themselves a power to generate, and bring forth their kind. An impregnated *female Aphis* or plant-louse can communicate

municate to her offspring the extraordinary power of producing others in succession, even to the fifth progeny, without any fresh impregnation; and, what is equally astonishing, we are told, that the same species of *Aphis* which in Summer was *viviparous*, becomes *oviparous* in Autumn: It is also wonderful that the *Coccus*, and *Oniscus*, no sooner bring forth their young, than they devour them; and lastly, if we descend to vegetables, however strange it may appear, certain it is, the *farina* or seed of the male flower impregnates that of the female, otherwise no fruit would be produced; for *Linnaeus* observes the Savin tree was fruitful in the Upsal garden, where the male plant grew near it, but in the Clifford garden, where the male was wanting, there was no fruit at all.

BUT the most extraordinary production in nature of the vegetable tribe, is the *Gramen Parnassi*, flore albo: It grows in meadows, and low marshy grounds, and blossoms in july and august. This beautiful flower has a hollow cone in its center, which is surrounded
with

with several upright chives, on the tops of which are placed small crescents or half-moons filled with *Farina*; when this is mature, the chives, by turns, bend themselves like a bow, and discharge the farina or prolific dust from these crescents into the apex or point of the hollow cone, and then return to their former state: I have seen with surprise, several of them, as if endowed with animal instinct, in the very act of discharging their *farina*.

THE *Tænia lata* has a mouth, which leads to a kind of longitudinal vein or *sinus* continued through its whole length, and capable of being injected; but seems to have no lateral pores or *spiracula*, like the *Tænia cucurbitina*, through which, the last, probably, derives its nourishment. This worm has been erroneously supposed to consist of a series of smaller worms, linked together like a chain; which mistake was probably owing to its power of *reproduction* and peculiarity of structure, its several rings or links resembling so many gourd-seeds, for which reason, it has also been named *Gourd-worm*.

IN general only one *Tania lata* has been found in the body; it has therefore been called the solitary worm; but this is also a mistake, for, sometimes there have been more: Indeed, considering its monstrous and incredible length of 165 feet, as mentioned in the Academy of Sciences at Paris, A. 1709; and of another in the Stockholm Memoirs, *eighty feet long*, so as to extend through the whole intestinal canal from the stomach to the anus; there scarcely appears room for any other.

SINCE many of the complaints arising from Worms are frequently mistaken for those which belong to other diseases; we shall endeavour particularly to point out their real difference. For instance, symptoms imputed to worms are also common to children cutting teeth; and in those of a more adult age, the *swelling of the upper lip and nostrils*, which has lately been pointed out as an infallible sign, is *peculiar to Scrophula*; as also that pain and tumefaction of the belly supposed to proceed

ceed from worms, being occasioned by a *scrophulous affection of the mesenteric glands*.

ITCHING of the nose, and grinding of the teeth, are almost certain signs of worms; particularly the first; the cause of which has not generally been assigned: It seems to arise from nervous sympathy, or consent of parts between the fine, *nervous lining* of the nose, and that of the intestinal canal, which are similar in structure; the last, being a continuation of the former.

THOSE symptoms, however, have also been found to occur in the *Hydrocephalus* or water in the head; but there is one sign usually attending this last disease, which will distinguish it from the other two, viz. a partial blindness and remarkable *dilatation of the pupil of the Eye*; as I had occasion to remark in the case of master T—ke of Westminster, whose disorder was thought to proceed from worms, and whom I attended, several years ago, with Dr. Wilbraham then physician to the Westminster Infirmary.

When

When the body was opened, a considerable quantity of *water was found in the head and abdomen*, without any appearance of worms.

IN cases of *tape-worm*, we have been informed that the patient is affected with a painful sensation about the Stomach, which ceases when he has taken food; but this is a very uncertain sign, and may be mistaken for one exactly similar; which, in speaking of the affections of the stomach, at page 7 of this Essay, I have remarked, is relieved in the same manner, viz. by replenishing the stomach with food.

As therefore many of the general signs of those pernicious reptiles are inconclusive, and, *independent of their being voided*, extremely fallacious; the best practical method will be, accurately to mark down the precise symptoms which occur in those patients, where, for the above demonstrable reason, we are certain of their existence; and also, then to notice the different *signs which are*
peculiar

peculiar to each verminous species thus expelled from the body.

RESPECTING the medicines to be administered for the expulsion of worms; it would be a great benefit to the community, if such of them only were pointed out, whose efficacy had been well established and *ascertained by practical experience*; the better to withdraw the attention of the common people from unavailing trifles. Of this efficacious kind is the celebrated Remedy of *Madame Nouffer* used in France, after the death of her husband, for the space of twenty years, and with such extraordinary success, that it was attested by the respectable names of Macquer, de la Motte, de Jussieu, Carhuri, Cadet, and Laffone, and published by order of the French King; which I have therefore set down as follows; but it should be remarked, that this medicine is chiefly to be considered as a specific in cases of the *Tape-worm* or *Tænia lata*, though it may also be found beneficial in those of the *Tænia cucurbitina* or *Gourd-worm* which is more difficult to expel,

and

and equally pernicious with the former; but is a *distinct species*, which ought not to be confounded with the other.

Madam NOUFFER's Worm-Powder.

TAKE two or three drams of the dried root of *male fern* gathered in autumn and reduced to fine powder, in four or six ounces of soft water: Let it be given in bed, early in the morning, and two hours after, the following bolus is to be directed: Take of mercurius dulcis and dry resin of scammony, ten grains, each; of gamboge, four grains; reduce them into fine powder, and make a bolus, with a sufficient quantity of any conserve. This bolus ought never to be directed without great caution, and proper advice, being composed of very powerful ingredients, and in a greater proportion than what is conformable to the present medical practice.

THOSE who are desirous of farther information on this subject may find it in *Dr. Foart Simmons's* account of the *Tænia*, where the

two species of this Worm are accurately described, and elegantly delineated in two Copper-plates. From the Doctor's translation of Madam Nouffer's method of administering her Specific for the *Tænia*, and the regimen to be followed during the cure; I have taken the liberty to transcribe the following particulars.

“THE day before the patient intends to take this remedy, he must avoid all aliment, after dinner, till about seven o'clock in the evening, when he is to drink about a pint or more of weak soup, soon after which he may eat a biscuit and take a glass of white wine: If the patient is costive; a clyster with a decoction of mallow-leaves, salt, and sweet oil should be administered: Early the next morning as already mentioned, the *Fern powder* is to be taken; if it excites nausea, and is rejected by the stomach, it will be necessary, soon as the sickness is gone off, to take a second dose. About two hours after, he must rise from bed and take the *purging bolus* already specified, washing

ing it down with a small quantity of any fluid. When it begins to operate, he may occasionally take a tea-cup full of gruel, or other fluid till the worm is expelled. Then and not before, Madam Nouffer gives him broth or soup, and he is directed to dine as usual, taking care to eat, sparingly, of such things as are easy of digestion.

WHEN the bolus has not been retained in the stomach or is not sufficiently purgative; four hours after it, the patient ought to take one ounce of Epsom salts dissolved in a sufficient quantity of water. It is usual for those who have kept down both the specific and purging dose, to discharge the worm before dinner; and *sometimes it is brought away by the Fern powder alone*, before the patient has taken the purging bolus. Such as have vomited the greatest part of both the powder and bolus, must, that night, repeat the whole process of the soup and clyster, &c. And the next morning another dose of the specific powder, omitting the purging bolus, and instead of it, taking the

same dose of purging salts, as before." This, with little variation, is the substance of Madam Nouffer's effectual method of destroying the *Tape-worm*.

SOME danger having been justly apprehended from the purgative bolus directed to be given after the *Fern powder*, especially the repetition of it, in weak constitutions; *Dr. Blackburne*, in a letter to *Dr. Simmons*, recommends *Ol. Ricini* or castor oil dissolved in the yolk of an egg, as a substitute for the bolus; from which he had experienced very desirable effects, as it operated without gripes or fever, and produced copious offensive stools with a few joints of the *Tænia*.

OIL will instantly kill bugs and insects; and this it seems to do by stopping their pores; and as many pores or *spiracula* have been discovered in the *Tænia cucurbitina* whose rings are easily separated from each other, by strong purgatives; *Castor Oil*, after the rough, drastic bolus, will be extremely proper for two reasons;
it

it will not only be soft and balmy to the tender excoriated bowels, but by its purgative quality will carry off fragments of the worm thus deadened and detached from the intestines, and by *closing its pores*, especially, when given *undissolved*, will probably have the same mortal effects upon such portions of it, as might *regenerate* if left behind, as it is known to have had upon bugs and insects.

THINGS destructive to one species of animal are not so to another; hence it may be presumed, that there are certain medicinal substances *specifically destructive to worms*, like the *Fern powder* to the tape-worm; by which, we find it was sometimes expelled before the drastic bolus had been given. The garden-snail or slug will feed, and fatten upon laurel-leaves which will kill cattle; and the *Cantharis* or Spanish fly, though a powerful caustic, is devoured by an insect void of acrimony and which applied to the skin has no corroding effect; a singular instance of the wonderful

assimilating power of some animal bodies of converting others into their own nature.

FOR the destruction of the tape-worm, *Dr. Mead*, after many years experience, recommends *filings of tin and red coral*, of each, equal parts reduced to fine powder; of which, one dram mixed with fyrup, or conserve, may be taken upon an empty stomach, twice a day.

SALT and Water is a popular remedy against worms, particularly what is called *Bittern*, a nauseous, bitter liquor drained off in purifying common salt. I was informed of a remarkable instance of its efficacy at Nortwich in Cheshire some years ago. A labouring man had long been tortured with such excruciating pains in his Stomach and Bowels, that he rolled upon the ground like one distracted; having tried almost every thing in vain, and despairing of a cure, he was advised by one of the common people to drink *Bittern*, which he accordingly did to such excess, that after enduring intolerable sickness and pain, insomuch that those
about

about him thought he had killed himself; he was seized with enormous vomiting and purging by which he voided a *tape-worm* of incredible length, and was soon relieved from his misery, by obtaining a perfect cure.

A SIMILAR case is mentioned by *Dr. Herberden*, in the first volume of the *London medical transactions*, where, the patient voided a large quantity of *Ascarides*, and other worms resembling *Botts* in horses, by drinking two quarts of water, with two pounds of common salt; from a repetition of which, the third morning, he was entirely restored to health.

THE great bastard, *black bellebore* or *bear's foot*, and *Indian pink*, *cabbage tree bark*, and *cowhage* are all powerfully destructive to worms; the three last of which not having been long introduced into practice, or universally known, it will be more necessary here to specify their dose and manner of exhibition.

SPIGELIA Marylandica or indian pink root was discovered by the *Indians* to the Europeans as a powerful vermifuge, and grows spontaneously in marshy grounds in several parts of South Carolina. It was first mentioned to me, as an efficacious anthelmintic, by Mr. Carne, a very intelligent man, who resided many years as a druggist at Charles-Town: He favoured me with a specimen of the plant and manner of its exhibition, which, coming nearer that of giving it by the native Indians, I here subjoin,

TAKE of the dried root and leaves of the Indian pink; reduce them into fine powder, and to children, from two, to eight years old, give for one dose, in mint-tea or sugared milk, from ten to twenty grains, upon an empty stomach, for six or seven mornings successively.

FOR infants, and those of delicate constitutions, an infusion of the plant, in the proportion of half an ounce, to one pint of boiling water, may be directed sweetened with sugar, which

which is then pleasant as common tea; of this, one table-spoon full, to three or four, may be given night and morning.

ADMINISTER to adults, in powder, from one scruple to half a dram, twice, or in strong constitutions even thrice a day: It gently opens the bowels. Mr. Carne informed me he had frequently thus directed it with good success, but that it sometimes occasioned giddiness with dimness of sight which was soon removed by spirit of lavender or a small quantity of any volatile spirit: This effect however I have never yet perceived in the least degree; perhaps it might be owing to the plant used in its recent state, which like fresh-gathered tea might then have a narcotic quality afterwards dissipated by keeping.

To insure the success of this Medicine, it will be necessary, by intervals, to continue its use for a fortnight or longer, especially when the infusion is administered: It will also be proper to direct a smart purgative with jalap
or

or senna, but if the bowels are tender, a spoon-full or two of *Castor oil* will be more proper.

A STRONG decoction of the *Cabbage-tree bark* obtained from the west Indies has there been experimentally found extremely efficacious in the destruction of worms: It may be made by adding a quart of soft water to one ounce of gross powder of its bark, which being boiled very slowly to the consumption of half; the patient, if an adult, may take a large tea-cup full or more, night and morning, upon an empty stomach, for three or four days successively; interposing a smart purgative at discretion, more effectually to expel worms thus deadened by the preceding medicine. To children of four or five years old, a wine-glass full of the decoction may be given sweetened with sugar, for two or three mornings, varying the dose, according to the age and strength of the patient.

For some time past, *Stizolobium* or *Cowhage* has been introduced into practice, in the cure
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of diseases from worms; and from many trials made with it here, as well as by the Planters in the west Indies among their negroes, has been found a medicine of very extraordinary efficacy, as also appears by a tract published a few years ago by Mr. Chamberlane.

THE pods of this west India plant called Cowhage are thickly beset on their outside with the *Siliqua hirsuta* of Linnæus, appearing, when viewed by the microscope, like so many *spiculæ* or small darts exquisitely sharp and piercing. In my *Lectures* on diseases of children, I observed that those *spiculæ* act on worms, *merely as a mechanical poison*, and destroy them by pricking and wounding them to death; in the same manner as hair cut extremely fine and given with the like intention; and which, in many instances, it has been known to effect, though in a less degree. That it has no specific virtue is certain; because both a tincture, and decoction of Cowhage have been tried, and found perfectly inert

inert and harmless, having produced no sensible effect similar to that of the *spiculæ* of Cowhage administered in substance.

THE most simple and least troublesome method of giving this medicine will be, to dip the ripe pods into melasses and then scrape off the *spiculæ* with a blunt knife, taking care they are not scattered upon the hands or body, as they would irritate the skin and occasion intolerable and incessant itching. A table-spoon full of these *spiculæ* thus obtained being mixed with a tea-cup full or more of melasses, may be given in the quantity of a tea-spoon full or two, to children fasting, for three or four mornings, successively; and to adults, a table-spoon full or more, for the same space of time; after which, a purgative with *undissolved castor oil*, may be taken the morning following.

DR. BANCROFT in his natural history of Guiana speaks highly of the efficacy and safety of Cowhage, but remarks that it was most successfully given in cases of the *Teres* or round

round worm; but later experience proves that it is equally powerful in expelling every species of worm, and without the least injury to the Stomach and Bowels: However, where they are tender and *stripped of their mucus* or disposed to inflammation; common prudence would teach us to avoid its use.

THERE is one species of *morbid affection incident to the Stomach and Bowels*, which, as far as I know, has not been mentioned by any author; namely, *a want of fat in the omentum*, which frequently happens in lean, emaciated subjects.

THE *Omentum* is a double membrane interlarded with fat, between the lamina or folds of which, the blood-vessels are numerously distributed: It is connected with the stomach above, and loosely over-spreads the intestines below, as a fine, oily covering which not only lubricates and anoints their surface but *defends them from cold, the better to preserve the fluidity and motion of the circulating blood*, as well as to allow their convolutions to move and glide over each other, *without attrition or pain*.

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THE *coldness of the Stomach, its want of digestion*, and disorders of the Bowels which follow the extirpation of the *Omentum*, in quadrupedes, all evidently point out its use in the human subject; and shew, that it was intended to warm and cherish those vital parts, to promote the circulation of blood through their vessels, and to support their several functions; consequently, when it becomes diseased, or wasted, and insufficient to answer those purposes, *the viscera will be affected with the preceding Diseases.*

IF we reason from the structure and use of the parts, it will be obvious, that such maladies will be most likely to admit of relief or cure, by supplying the natural defects of the *Omentum*, with an artificial substitute; namely, a soft, warm covering of fur, or fine wool included in double flannel, over the whole abdomen; and the application of volatile liniment to the stomach and bowels; which, with the frequent use of a flesh-brush, will warm and invigorate the languid Viscera, and assist their several functions.

functions. For the efficacy of such remedies, *however simple*, we may appeal to the feelings of those who have made use of them, and sensibly experienced their good effects.

BESIDES the various causes already assigned for the diseases under consideration, there are some others of the accidental or accessory kind; among which may be named, the suppression of long-accustomed evacuations, as the bleeding piles, or menses; eruptions repelled from the surface of the body, stoppage of perspiration from the feet, or old ulcers which discharged a sanious matter, too suddenly closed. Also the retention of *extraneous bodies* incautiously swallowed, as fish-bones, plumb-stones or the like, which being lodged in the flexures of the intestines occasion the most excruciating colic *pains*.

SOMETIMES, these bodies have been found enlarged to an enormous size by making a center or *nucleus* of stony incrustation formed around them, from the aliment passing through

through the intestinal canal. I have one of them in my possession which belonged to the late Dr. Nicols, much larger than a swan's egg, which was taken out of the colon of a horse, and occasioned the death of that animal.

THE stomach and general habit of body are also often injured by *bad water* and *unwholesome air*, especially when the last is vitiated by its vicinity to lime, or brick kilns, or the metallic fumes of smelting-mills, and iron-founderies: The effluvia of fresh paint, or new lime-walls, candle-manufactories, or burying-grounds, all destroy the natural purity of air.

MARSH vapour, or a warm, moist atmosphere overcharged with *fixed air* proceeding from dung-hills, tan-yards, fermenting liquors, or green vegetables, as *new hay*, &c. which not only ferment but take fire, are also pernicious; for, they contaminate the atmosphere, and by destroying its elastic, vivifying principle, render it highly noxious to animal life.

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THE powerful odor of some *Perfumes*, and their effect on the organs of smelling, inasmuch as the head and stomach sympathize with each other, frequently occasion *sickness at stomach and faintings*. Pigments, and beautifying lotions applied to the skin, when of a pernicious nature, and absorbed, so as to enter the blood, have all their share, especially in great cities, where they are commonly used, of adding to diseases of the Stomach and Bowels.

As most of the above causes, by being *pointed out, and foreseen, may be avoided*; it is evident that, in such cases, prudent caution will be more necessary than Medicines.

It can, therefore, only be proper to signify, that whenever there is *local irritation of the stomach, or intestinal canal*, from any of the preceding causes, attended with *Costiveness*; the exhibition of *Castor oil*, in the quantity of a spoonful or more, by intervals, will always be attended with beneficial effects and is preferable to every other laxative.

SHOULD the Constitution suffer from an atmosphere too much loaded with phlogiston, or *fixed air* which destroy its elasticity, and have often proved fatal in the fumes of charcoal, and metallic substances in confined places; the danger may, in a great measure, be prevented by the steam of hot water frequently agitated to increase its evaporation, by which, the fixed air and mephitic principle will be absorbed as fast as it is discharged, and consequently rendered harmless.

THE confined air of assembly-rooms, bed-chambers, and other places which become unwholesome by animal perspiration, and the smoke of burning candles, may thus be made more pure and fit for respiration; and by the addition of *Vinegar* to boiling water, the steam will be rendered *antiseptic*, and not only absorb the contaminated air, but also powerfully resist putrefaction.

THIS Remedy, if not overlooked or neglected, because it is simple, and easily applied, like many others of the valuable kind, may be of the
greatest

greatest benefit to Artificers, and Mechanics who are affected with violent head-aches, stupor, and sickness at stomach, with pain in the bowels, by sitting near *charcoal fires* or the *fumes of melted lead*, in confined air; or those exposed to the effluvia of fresh-painted, or lime-plastered rooms, where they are constantly obliged to work. *It would preserve many from ill health, and others from a lingering death.*

I WAS, lately, desired to visit a tradesman in Long-acre, who, from the poisonous fumes of melted lead, was seized with the most excruciating *colic pains* — a disease in the north of England called *Belland*, attended with costiveness and contraction of his bowels, insomuch, that his friends expected his death every hour. I directed blood to be drawn from his arm, and clysters of tripe-water with Castor oil to be injected: Internally he took liberally a mixture with mucilage of Gum arabic, Castor oil, and Syrup of white poppies, which afforded him great relief; but in the evening of the same day, his pains returned with so much violence that from his moaning and outcry,

there was reason to apprehend a mortification of his bowels: I then directed his belly to be fomented, and bathed with warm oil; a double flannel was applied round his body, and his feet were put into warm water. The oily mixture, and clyster, with the liberal addition of an Opiate were repeated, and in a few days he perfectly recovered.

IF *Eruptions*, which nature for her security had thrown out on the surface of the body, have been repelled and driven back upon the *Bowels*, attended with sickness and pain; the immediate use of a warm bath, and afterwards thirty or forty drops of *antimonial tincture* in mint-tea, or an infusion of elder-flowers, at bed-time, will be proper to promote a free perspiration; after which it will be necessary to open the bowels by a spoonful or two of *Castor oil*.

THOSE of a weakly habit of body, who lead an inactive life, are frequently subject to severe fits of *Colic* after eating, agitation of mind, or sudden changes of weather; which indicate bad digestion,

gestion, great nervous sensibility, and a weak, infirm state of the *Viscera*.

SOLID food, an emetic, or purgative medicine, after anger, have been found dangerous, and act on the body with the violence of poisons. After great disturbance of mind, I have observed, that the Stomach and Bowels are affected with pain, and endeavour to discharge their contents by *vomiting*, or a *diarrhœa*, but if neither of these evacuations happen; sickness, a spasmodic affection of the biliary ducts, yellowness of the skin, a fever, and sometimes convulsions have been the consequence.

IN this irritable state of the Viscera, they are unable to bear any additional stimulus, and therefore, instead of rhubarb and the like, commonly administered, the proper remedies to give relief, are bleeding, opiates, and the warm bath, with anodyne clysters; the first will abate the circulation, the last will relax the solids, soothe the nerves, and dissolve the spasm.

THOSE faculties of the Stomach, and Bowels, called *vomiting* and *purging*, may not improperly be mentioned here. *Vomiting* arises from an inverted, convulsive motion of the stomach, assisted by the sudden contraction of the diaphragm and abdominal muscles; by which its contents are rejected and thrown up, instead of passing downwards. *Purging* is produced by some particular irritation of the bowels, which preternaturally increases their expulsive motion downwards. Nausea and vomiting only differ in degree, for both imply a disagreeable impression made upon the stomach.

THOSE who are subject to colic pains, or tedious habitual complaints of the bowels, by taking cold in severe weather, or such like causes; will find very great relief, by wearing fine flannel next the skin and keeping their feet extremely warm: if the pain is violent, an emollient clyster, prepared with elder-flowers and three or four white poppy-heads, will afford ease; bottles filled with hot water, and wrapped in double flannels may be applied to the belly and soles of the feet, and an infusion
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of rosemary may then be drank warm, in bed, to promote a gentle perspiration.

INSTEAD of the frequent use of spirituous liquors, or cordial medicines which only afford a *momentary relief*, and have been the occasion of fatal consequences, the patient should be careful not to err in the quantity or quality of his food : He should keep his bowels laxative, abstain from all fermented liquors, and confine himself to pure distilled water for common drink ; by which means, many have been perfectly freed from obstinate and painful complaints of the bowels.

AFTER such disorders are abated ; half a table-spoonful of tincture of peruvian bark with cardamom seeds, in a large glass full of Spa, or pyrmont water taken twice a day ; with moderate exercise, in dry, cool air, will bid fair to prevent a relapse.

I HAVE here purposely omitted the mention of *bilious, nephritic, and hysteric colic*, as distinct diseases ; since, in general, they can only, with propriety, be considered as so many morbid symp-

toms, of the *acute kind*, which did not, therefore, so properly come under consideration.

WEAK, sedentary people have generally a slender appetite, and bad digestion, attended with flatulence, hectic heats, and nervous affections; and on the contrary, when bodily strength is good, so are appetite and digestion: The circulation of blood is then brisk and free, the spirits lively, and all the natural discharges being regular, no gross humours or unsound juices are retained to injure the constitution.

THESE things premised, it is evident, that such as mean to remain free from *chronic diseases*, should avoid, as much as possible, the general causes which destroy appetite, and weaken the digestive power of the stomach where their first foundation is laid. Whatever remedies have been found most effectual in repairing the constitution and increasing bodily strength, such will always most powerfully and permanently assist digestion; consequently *cool, dry, pure air, and moderate exercise, are the best of all stomachics*: They will
increase

increase animal heat, and promote that circulation of the blood which regulates and supports the several secretions and excretions, upon which the health and well-being of the body entirely depend.

THE great difference experienced by *Invalids*, in their strength, spirits, and appetite, when they use *exercise* in a bracing, frosty air; compared with that sickly languor which they feel in warm, damp weather, when they indolently sit still in their chambers, and breathe a confined, inelastic air, will sufficiently prove the truth of this assertion; for, although *Peruvian bark*, *steel*, *bitters*, and the *cold bath*, are all excellent Remedies when properly directed; their effects will be greatly increased, and their efficacy rendered much more permanent, by the assistance of those natural benefits.

S E C T.

S E C T. VI.

*Of the Hemorrhoids or Piles ; their Nature,
Treatment and Cure.*

THE alimentary tube extended from the Stomach to the anus, at its extremity, forms that part, which, from its streight direction is named *rectum*; and which is the seat of the *Hemorrhoides* or Piles, so called, from the throbbing and pungent, local pain within the verge of the anus, occasioned by that disease.

MORE clearly to understand the nature of this painful malady, it is necessary to observe, that in all parts of the animal body, the blood sent from the *Heart* by the *arteries*, for its nourishment, is again returned to it by the *veins*; and, that in the first of those vascular systems, it is impelled by the force of the heart which communicates to it that motion which is called the *pulse*; but in the veins which lie too remote from its influence, the circulation is more slow, and the blood, from want of impulse, returns through them

them with considerable difficulty; although it is greatly assisted by the action and contractive power of the several contiguous muscles.

THIS effect is exemplified, by observing with what velocity the blood may be forced through a small orifice in the arm after venesection, by grasping a lancet-case or other solid body, which puts the muscles in a contracted state.

THE *rectum* has no contiguous muscles lying in its own direction, to produce such effect, but is only surrounded with cellular membrane filled with fat, and is supplied with hæmorrhoidal veins and arteries, which run upwards upon its surface; consequently, when the position of the body is erect, *the blood returning to the heart by the veins must ascend against its own gravity*; and this will be effected with greater difficulty, from the want of that muscular, compressive force common to other parts of the body.

THESE circumstances being previously attended to and clearly understood; it may then be easily
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seen, why any addition to this *natural obstacle* in the blood returning by the veins, may be so increased from accidental causes as to bring on the Piles; and consequently, why those of an indolent, inactive life, who indulge in full diet, and use little exercise are most subject to that disorder; and also why the immoderate use of spirituous liquors, or high-seasoned aliment, a costive habit, uterine gestation, sleeping in warm chambers, on beds of down, and all such accessory causes as heat the blood and compress its returning vessels, often produce that excruciating malady.

BESIDES the more immediate causes already assigned for this frequent disease, there are others of a more remote kind; namely, external violence, such as that of extreme agitation on horse-back, strong drastic purgatives, taking cold, or violent anger and anxiety of mind. The frequent use of *Bitters*, and *Aromatics*, by hardening and constringing the fibres of the intestines, robbing them of moisture, and producing *costiveness*, and fever, have also been observed to occasion Piles.

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THIS disorder of the alimentary tube is distinguished into *internal* and *external Piles*: The first, are not attended with a rupture of vessels or discharge of blood; but in the last, the veins are often so overcharged, as to push outwards in form of irregular prominences which burst and pour out their contents, being then called *bleeding Piles*.

THE internal and external hæmorrhoidal vessels not only communicate with each other, but with those of the *Mesentery*, and *abdominal Viscera*, in general.

HERE it is proper to remark, that blood is frequently discharged from different parts of the body, at different periods of life, according to the peculiar habit which then prevails: In youth, it often escapes from the *nose*; at maturity, it proceeds from the *stomach* or *lungs*; but in a more advanced age, or the autumnal season of life, when *venous plethora* prevails, or in other words, when the veins are overcharged with blood, it frequently passes off by *bleeding piles*, either to compensate for the loss of some other necessary discharge, or to relieve

relieve the constitution of redundant blood, accumulated in the abdominal viscera.

IN young subjects, when the discharge is profuse, the blood generally escapes from arteries; but, at a more advanced age, especially in those of a full habit, and sedentary life, where *venous plethora* prevails, it is commonly poured out by the veins.

It has been asserted by *Tissot*, that *Hæmorrhoids* are always the effect of ill health: This without doubt is sometimes the case; since we know that the source of this malady may be remote from the part locally affected. But, on the contrary, many instances may be brought to shew, that bleeding Piles frequently arise from *simple plenitude*, and at other times may be considered as a *critical discharge*, which prevents some diseases and relieves others.

A *schirrous liver* or *obstruction of the viscera* may therefore be the proximate cause of Piles; for if the blood, returned from the abdominal contents, cari-

not be freely transmitted through the liver with which they freely communicate, it must then be accumulated in the intestines and will overload and distend their vessels, even to that of bursting, as in a flux of blood from the Piles ; and which, under such circumstances, is merely a symptom. To effect a cure, our attention should therefore be chiefly turned to those morbid affections of the Viscera, as the original cause of the disease.

WHEN bleeding Piles succeed *diseases of the liver*, intemperance, violent passions of the mind, obstruction of menses, or an habitual spitting of blood ; the discharge ought only to be moderated, but not totally suppressed.

I HAVE seen, several times, the good effects of this discharge in such cases ; and, on the contrary, instances, where from its over-hasty stoppage, great anxiety, with palpitation of the heart, and internal fluttering have been brought on ; attended with dejection of spirits, and a train of distressing disorders, which could not be so effectually

tually relieved by any method as that which procured a return of the discharge.

IN complaints of the *head* and *breast*, attended with low spirits and melancholy; its salutary effects have been observed; and in disorders of the *abdominal Viscera* it has been found more immediately serviceable, in consequence of a communication of vessels between those parts, and that from which the offending blood was evacuated.

IF a sudden suppression of the hæmorrhoidal flux is followed by fever, difficulty of breathing, or other oppressive symptoms; leeches should be applied to the verge of the anus, and clysters prepared with an infusion of elder-flowers and soap may be administered; the patient may also use a warm bath or sit over the vapour of warm water; a tea spoonful of the tincture of *black bellebore*, in a small quantity of any fluid, may then be given twice a-day.

BUT in cold, phlegmatic habits, nothing has been found more efficacious in recalling bleeding piles,
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than small pills of purified *aloes* and soap, one of which may be taken night and morning. In such cases, moderate exercise on horseback has been found beneficial; but all violent motion is improper, and to be avoided.

So powerful is the effect of *aloes* in producing piles, that we are told, the *Jews*, *Venetians* and eastern people in general, from the frequent use of this drug, are of all others most subject to that disorder.

SHOULD these methods of recalling the *habitual, bleeding Piles* prove ineffectual, and their suppression be succeeded by giddiness of the head, or symptoms of Apoplexy; it will be necessary immediately to draw blood from the arm, or to direct cupping with scarification in the *nape* of the neck; the body should be kept cool and laxative, and the excretions of perspiration, and urine gently *promoted*; the first intention may be effected by the antimonial tincture given in any fluid; the last by plentiful dilution with nitre; and although *Aloes*, as already remarked, is a powerful medicine,

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cine,

cine, it should always be avoided where pain, fever, or symptoms of plenitude are present; lest, by its heating quality, it should aggravate the disease, and bring on an abscess or *fistula* in the affected part.

WHENEVER the hæmorrhoidal flux is profuse; the danger is not so much to be estimated by the quantity of blood, as the attendant symptoms; therefore, whether it be large or small, in quantity, if the patient is relieved from oppression of spirits, hypochondriacal affections, or disorders of the Viscera, to which he had been subject; it ought not then to be stopped: On the contrary, when he becomes faint, and the pulse loses its firmness, with evident loss of strength, it should then be totally suppressed without delay.

WHEN the discharge is profuse, and supervenes a putrid dissolution of the blood, as in *scorbutic cases*, with a morbid affection of the *Liver* or *Spleen*, and with great languor, flatulence or distension of the stomach and bowels, it denotes immediate danger; for, under such circumstances, and attended by such symptoms, it has often proved fatal.

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THERE is a manifest sympathy between the menses and bleeding piles: When the first are obstructed, I have observed that the last sometimes became periodical, and supplied their defect. Such discharge, therefore, can never be stopped without danger to the constitution; neither should it be suddenly restrained, when it happens about the cessation of the menses, for then it seems to be an expedient of nature to prevent the inconvenience which might arise from the want of that long-accustomed evacuation.

BLOOD which escapes by the open or bleeding piles, may be distinguished from that voided in *bloody flux*, by the following signs. In the first, the pain is local, chiefly confined to the *anus*, and the blood comes away alone, or before the stools; but in the last, the pain is more violent and extended over the belly; the blood is discharged with *fæces*, or is afterwards voided by the efforts of straining.

WHEN the *Piles* are attended with excessive pain, fever and other violent symptoms, the inflammation

flamination is often so great as to produce a collection of matter terminated by a *fistula in ano* or hollow ulcer of the part, which afterwards requires cutting; and, in bad habits of body, at an advanced period of life, is often incurable.

IN the *internal piles* attended with pain and fever; bleeding, laxatives, and spare, cooling diet of the vegetable kind are proper. The liberal use of ripe fruits is beneficial, also weak broths, with a large addition of cooling herbs, and *nitre* instead of common salt, which thus taken is palatable, and productive of good effects, by promoting perspiration and urine, as well as by gently opening the bowels.

THE patient should keep his body in a horizontal position as much as possible, by lying down on a bed or couch, and nothing will relieve him so much as being kept extremely cool: His food should be light and easy of digestion, and imperial water with manna, for common drink will be proper.

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WHEN the pain is excruciating; *Leeches* may be applied to the affected part, and tempted to take hold by touching the surface with blood; but if they will not fix, blood may be safely discharged from the larger piles, with the point of a fine lancet, which generally procures ease. An opiate clyster, scarcely milk-warm, may then be administered in a small quantity, if the pain continues acute, and if the pipe is covered with a pigeon's gut inverted, it will glide up with much less pain to the patient: If it be injected too warm, or in a large quantity, it will defeat the purpose of an internal fomentation; instead of relieving it will give pain, and soon occasion its own expulsion.

WHEN the patient cannot submit to this method, he may be placed over the steam of warm water, proceeding from a strong decoction of white poppy-heads and elder-flowers, to which half a table spoonful of *liquid laudanum* has been added at the time of use.

NOTHING will give more instant ease in a painful fit of internal piles, than the application of in-

tense cold to the surface of the body. A glass of cold spring water may be taken at the same time, and a soft sponge dipped in lime-water, or a very weak solution of Goulard's extract of lead may be applied to the affected part: But where such pain is attended with much fever, inflammation, and internal throbbing denoting formation of matter; loss of blood from the arm, or by leeches, from the verge of the anus, and emollient applications, rather than those cold or restraining, are much more safe and proper.

THE affected part may be bathed with warm, new milk, and afterwards a cataplasm with bread and milk, and a tea-spoonful or two of opiate tincture, will be proper; or one prepared with bread-crumb beaten into a pulp, with a strong decoction of white poppy-heads and elder-flowers, Lenitive electuary, or that with Cassia, which is much more pleasant, should then be taken in the quantity of a nutmeg every other morning, or oftener, so as to keep the body gently laxative.

SUCH temporary fits of the piles attended with acute pain, are often occasioned by the retention
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of wind or indurated fœces in the rectum, which being discharged with mucus, and a small quantity of blood; the patient generally finds ease; especially if he takes care to live temperate and keep himself cool, and laxative.

OINTMENTS are most proper after the pain and inflammation are abated: The unguentum saturninum, or a cerate of oil and white wax is most eligible, on account of its whiteness and want of smell; but such applications are not so efficacious as generally imagined, and the more simple they are, so much the better.

SHOULD the strength be apparently wasted by too profuse a discharge of blood, it may be restrained by keeping the body cool, and the use of vegetable acids; such as the juice of lemons, tincture of roses, or a decoction of *tamarinds* sweetened with manna. The affected part may be bathed twice or thrice a-day with a soft sponge dipt in a strong infusion of red rose-buds and pomegranate-peel with port wine, to which a small portion of alum may be added, and afterward gently bound on the part.

Seltzer water with milk will be proper for common drink; or what I have found preferable, in costive habits, a *solucion of the crystals of Tartar, with a sixth or seventh part of Borax*, which will not only soften the harshness of the tartar, but will promote its more perfect solution in water, with which it otherwise difficultly unites. When directed in this manner, it makes a neutral solution, of the most mild and efficacious kind; it will not only gently open the bowels, quench thirst, and abate feverish heat; but will also act as a *powerful aperient in obstructions of the Viscera*, and in dropical cases will promote the plentiful secretion of urine: In short, thus administered, it will produce much more salutary effects, than when given alone in the usual manner, as I have had frequent occasion to observe.

A tea-cup full of the strong infusion of peruvian bark with red rose-leaves, and elixir of vitriol, as a mild astringent, may then be taken twice a-day with great advantage; and this will be more necessary, as an excess of the discharge, when long continued, has been observed to bring on a bloated habit of body, sometimes followed by *Dropsy or Consumption*.

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THE extirpation of those small protuberances called Piles, by ligature, is the last remedy to be proposed in obstinate cases, and has been found effectual when other means failed; but this ought never to be used without proper advice, and the assistance of a skilful surgeon.

I HAVE here purposely omitted the mention of *sulphur*, as a medicine frequently administered for the piles; but from what I have repeatedly seen of its effects, I cannot think favourably of it; having twice observed a dangerous and profuse hæmorrhage, occasioned by its liberal use. It evidently increases the blood's motion, and heats the body, and therefore acts in a manner directly contrary to the intention of giving relief, like many other things more regarded from custom than propriety. When it has been thought of benefit; I believe that was more owing to the lenitive electuary usually joined with it, than to any power of its own. This opinion seems confirmed by the good effects of sulphur in *chronic rheumatism* and other cases of the same kind, proceeding from weak vessels and a languid circulation;

circulation; where it seems to act by promoting a free distribution of the blood, and increasing insensible perspiration.

THOSE who have been subject to *Piles* and wish to prevent their return, should keep the body laxative, and live temperately on light and simple food; they should use gentle exercise, and drink pure water, avoiding spirituous, or fermented liquors, night-air, and as much as possible, anger or anxiety of mind.

A DUE attention to the preceding *Rules and Cautions*, would generally be the means not only of preventing pain and inflammation, but the danger of an *Abscess*, often ending in a *fistula in ano*; especially in those of advanced age, and a gross, scorbutic habit of body, who live on full diet and use little exercise; as will more plainly appear in the next section, on *Diseases of the Liver*, with which the *hæmorrhoids* are frequently complicated.

S E C T. VII.

Of morbid affections of the Liver, and Spleen ; viz. Inflammation, Abscess, or Schirrhus ; with their Treatment and Cure. Also of bilious Diseases in general ; and of Gall-stones or bilious Concretions, with their various Symptoms, and method of Cure.

THE following Observations are chiefly confined to *chronic Diseases of the Liver*, which are much more frequent, in this climate, than those of the *acute kind*.

DISEASES of the Liver are often the consequence of *Intemperance, and excessive heat, joined to moisture* ; and therefore, are most common in the east Indies, and other hot climates, especially after the *Monsoons*, or rainy seasons. In this country, however, those of a bilious habit, who are addicted to the immoderate use of spirituous liquors, which may be justly named *hepatic poisons*, are likewise subject to diseases of this organ : Also, such as
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reside in low, unhealthy situations, during the damp, autumnal seasons ; more especially, if they are inactive and labour under anxiety of mind.

As a minute description of the Liver would not only be unnecessary, but imperfectly understood by the generality of Readers, it can only be requisite to afford a competent idea of its structure and use.

THE Liver appears to be the most complex Organ in the human system, being composed of a pulpy, tender substance, and a congeries of various vessels, of different orders ; chiefly, *for the purpose of preparing Bile*, and transmitting it into the intestinal canal ; although, by the antients, it was erroneously supposed the principal organs of sanguification.

It may be considered as a large gland consisting of two lobes, the largest of which is situated on the right side, above the short ribs, immediately under the arch of the diaphragm, a part which divides

vides the breast from the belly; and its small lobe on the left, above the stomach, upon which a part of it lies in contact, and is extended.

THE Liver chiefly receives its blood by a large vein named *Vena Portarum*; and that its distribution may be better understood, it may be compared to a shrub or small tree, having its trunk in the center, its branches in the circumference of the Liver, and its root in the whole abdominal viscera; namely the *intestines*, *mesentary*, and *omentum*, &c. from all which it brings reflux blood, for the *secretion of bile*, the use of which has been already specified in the first section.

IT is here necessary to remark a certain peculiarity in the distribution of its blood-vessels; for, instead of receiving blood by an artery, that fluid is sent to the Liver by a vein, as already mentioned; so that the *order of circulation* is here inverted, for purposes agreeable to the intention of nature, but which, it is not necessary to enlarge upon, because it could not be useful to the Reader.

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NOTWITHSTANDING the several vascular systems of the Liver are manifestly distinct; we know by injections, they communicate with each other; and although they are so intricately disposed as to render its functions somewhat obscure; it is obvious that the bile is prepared and strained off from the blood, by the extreme branches of the *Vena portarum*: From thence it is taken up by a second order of vessels named *pori bilarii* which by uniting and reuniting, form one duct discharging a part of it immediately into the intestinal canal; the rest being conveyed into the gall-bladder, where, by stagnation, it becomes more thick, bitter and exalted in quality, than that flowing from the Liver.

THE *Gall-bladder*, in shape and size, resembles a small pear, and is placed on the right side, in the concave part of the great lobe of the liver: From it proceeds the *cystic duct* which joins the *hepatic duct* or trunk of the *pori bilarii* coming from the Liver: By the union of those two small canals, the *ductus cholidochus* is formed, which discharges bile into the intestines, as already mentioned.

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THE *hepatic bile* proceeding immediately from the Liver, flows constantly into that part of the intestinal canal called *duodenum*; but the *cystic bile* from the gall-bladder, is only discharged at certain times, by the irritation, or pressure of a full stomach, when the bladder is most turgid with bile.

THE blood brought by the *Vena portarum* from the whole abdominal Viscera, having thus parted with its bile, is taken up by a third order of vessels which by uniting constitute one large trunk called *Vena cava* carrying it directly to the heart, the main instrument of life and circulation.

THE *hepatic artery* is another vessel supplying the Liver with blood, which seems intended for nourishment only; its branches accompany those of the *Vena portarum*, with which, and its own corresponding vein, it also communicates, in common with the other vascular systems of the Liver.

FROM this distribution of the *Vena portarum* through the substance of the Liver above, and the abdominal

abdominal viscera below ; it may more easily be comprehended why those parts sympathize with each other, and are alternately, or mutually affected by every cause which obstructs the course of their blood, and hinders it from being freely transmitted through their several parts. Should the Liver, for instance, be affected with inflammation, abscess or schirrus ; the *intestines*, *mesentery* and abdominal contents which supply it with blood, must become obstructed, overcharged and distended ; hence a sense of weight, oppression and indolent pain through the whole abdominal region. To this cause also the hæmorrhoids are frequently owing, varicose swellings in the veins of the legs ; hypochondriac affections ; and a bloated habit of body ending in *jaundice*, *dropsy*, or some other chronic disease.

THE most obvious and common causes of *such obstruction*, are external violence, and an unfavourable, bending position of the patient's body ; from whence the several *vitals parts* remain in a state of long, and violent compression, by which the course of their blood is not only obstructed, but their
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vital functions are impaired or destroyed; the pernicious consequences of which I have more circumstantially pointed out at page 156, in speaking of diseases peculiar to certain occupations.

WANT of sufficient exercise, and full diet may likewise be assigned as manifest causes of plenitude and obstruction; especially the immoderate use of such high-seasoned, tenacious *aliment* as cannot easily be subdued by the stomach, or assimilating powers of the body; and to this *cause of visceral congestion*, as well as the production of *Gall-stones*, none are more subject than those of a studious disposition, who lead an indolent, monastic life.

ON the other hand; should any of the abdominal viscera be affected by abscess, or exulceration from a *scorbutic, scrophulous, or cancerous cause*; their diseased humours being transferred to the Liver will not only contaminate its substance, and disorder its functions, but, like morbid leaven, will taint the mass of blood passing through it, from the viscera, and destroy the whole constitution.

FROM the slow and sluggish motion of the blood through the Liver, and its being endowed with less sensibility, than is common to other parts of the body, especially in its interior, pulpy substance; it is seldom subject to acute inflammation, except from powerful causes; but, for the same reason, it is often affected by chronic inflammation, and obstruction ending in *Scirrhus*.

DISEASES of the Liver are most frequent in the autumnal season, or near the vernal, and autumnal equinox when the weather is changeable, and excessive heat is succeeded by severe cold. The blood and juices are then rarefied and expanded, and as suddenly chilled and condensed; by which, together with that violent contraction of the solids which must then necessarily happen, they will be locked up and impacted in their vessels, so as frequently to occasion a *Scirrhus* or preternatural induration, and enlargement of the Liver, or other glands.

THIS observation being verified by repeated experience, should be a caution to those who inadvertently expose themselves to falling dews, or night-

night-air at those seasons; or who imprudently take large draughts of cold fluids, or iced water when the body is violently heated by exercise, or other causes.

IN every inflammation of the Liver the symptoms are more or less acute according to the degree of sensibility in the part affected: When the membranous covering of its superior convex part, or the ligaments which unite it to the diaphragm are inflamed; the pain, fever, and difficulty of breathing are much more violent, than when its interior, pulpy substance, or its concave, inferior part are affected; which being less nervous are less susceptible of the morbid cause.

If the nervous parts of the Liver are affected; the pain is more acute, and shoots upwards towards the chest, extending high as the neck, and particularly *affects the right shoulder*: The patient has generally a dry cough, with symptoms resembling those of pleurisy, from which it may be distinguished, by want of expectoration, and the pain being seated above the short ribs,

chiefly on the right side : The degree of fever is also less, and the patient cannot lie on the left side without much pain ; owing to tension of the connecting parts of the Liver, on the opposite side.

SUCH morbid affections of this organ should also be distinguished from that *deep-seated, fixed pain*, near the pit of the stomach towards the right side, attended with hiccough and vomiting, which often proceeds from *calculous concretions* in the biliary ducts.

THIS acute species of inflammation is to be treated, in many respects, like the *Pleurisy* ; namely, by copious and repeated bleeding, plentiful dilution with nitre, and where the pain and fever are violent, by the application of a large blistering plaster to the right side. The patient's drink should be given milk-warm, and the excretions of urine and stool should be gently promoted ; those evacuations being here more necessary than in pleurisy, from the patient's inability to expectorate, as in that disease,

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WHEN these means are ineffectual, the inflammation is sometimes terminated by *Scirrbus*, but more frequently by a fatal internal suppuration; for, there are few instances of the patient's recovery, except where the matter was freely discharged outwardly, and had no communication with the internal, vital parts.

ON the method of treating this dangerous inflammation of the Liver, called *Hepatitis*, as practised in the east Indies with extraordinary success, it may be necessary to enlarge.

INFLAMMATION of the Liver is usually terminated by *resolution*, *suppuration* or *scirrbus*: The first may be expected when the disease is recent, and medicines have been administered in due time; the second, where it is attended with much pain and fever; and the last, in bad habits of body, when it has been long continued, or confirmed by intemperance and hard drinking.

IF the inflammation ends by *resolution*, either from the efforts of nature, or the power of medicines;

cines ; that is most commonly effected by a critical hæmorrhage from the nose, the bleeding piles, a copious discharge of turbid urine, or profuse perspiration.

IT has already been remarked, that where inflammation is succeeded by an abscess or collection of matter which discharges itself outwardly, the patient sometimes recovers ; and even when it breaks internally ; instances have not been wanting, though uncommon, where being carried off, through the biliary ducts, into the intestinal canal, the event has also been favourable. On the contrary, if matter makes its way through the diaphragm into the cavity of the breast ; it suddenly destroys the patient.

WHATEVER may have been the prejudices against Mercury in many diseases of the Liver ; the extraordinary success of its exhibition sufficiently warrants its use, in preference to other medicines. It has been said, with some appearance of reason, that, considering the delicate, and almost pulpy consistence of this organ, it might be dangerous

gerous to administer Mercury, which, by increasing the circulating power of the blood, instead of diminishing inflammation, might break down its tender texture, and occasion a fatal, internal suppuration: Indeed, I confess myself one of the number who, in some degree, was influenced by this opinion; but repeated practical facts, well authenticated by those who resided in the east Indies where the *Hepatitis* is most frequent and fatal, leave no room to doubt the superior efficacy of Mercury; since they must have had sufficient opportunity to observe the various effects of medicines, and the different termination of this disease.

DR. *Spink*, now physician to the Hospital at Bombay, Dr. *Coul*, and Dr. *Moody*, as well as Mr. *Perkins*, surgeon, who formerly were my pupils, and who all were many years in the India service, unanimously agree, that Mercury, properly administered, is the principal medicine to be depended upon in *Hepatitis*. I shall not therefore here oppose those principles which I have always endeavoured to maintain,

tain, viz. that well-established practical facts should, at all times, supersede plausible conjectures and unsupported theory.

IN confirmation of this assertion, a circumstance of the humiliating kind here presents itself to the medical Reader. The antient physicians, from their want of that anatomical, and physiological knowledge which the moderns possess, were obliged to reason by analogy where facts were wanting: Their invention was fruitful, and their surmises often plausible and acute; but, they frequently erred, by trusting too much to speculation and conjecture. They considered the *Small-pox* as a putrid disease of the eruptive kind, and supposing a considerable degree of fever necessary to throw out the eruption, and expel the morbid cause from the blood; they enjoined the patient a *heating regimen*, and directed warm, cordial medicines, which they called *alexipharmics*, to assist nature in forwarding this design: He was confined to a close bed-chamber from which the refreshing atmosphere was assiduously excluded, and where he breathed a confined, inelastic, and putrid air; without being allowed to quench his intolerable thirst
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by cooling drinks, or to exchange his suffocating chamber for one where he could breathe with more freedom.

By this rigorous, and oppressive treatment, the disease often became mortal; not so much from its own nature, as the dangerous symptoms from thence occasioned; namely, petechial spots or purples, bloody urine, &c. which under such circumstances, were rather occasioned by a putrid dissolution of the blood, than the malignity of the disease itself.

IN short, from practical observation alone, we now certainly know, that this, was it so intended, would be the most certain method which could be devised, to destroy the patient; although it was the established and uniform practice of former ages, till the time of the honest and judicious Sydenham who was often treated with arrogance and indignity by his medical brethren, for venturing to differ from the general opinion, and depart from such fatal practice, for one diametrically opposite to it, namely, the *cooling Regimen*, by which the lives of many thousands have since been happily preserved.

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ALL speculation, therefore, apart; when copious bleeding, fomentations, and blisters, with plentiful dilution, do not soon remove the symptoms of *Hepatitis*; after opening the bowels by a gentle purgative; recourse is immediately had to mercury, in the east Indies, both internally given and externally applied, till a gentle spitting for a fortnight or longer, is brought on; by which, this dangerous disease is generally effectually cured. ;

IN such cases, Plenck's preparation of Mercury with gum arabic, seems preferable to the rest; for the mercurial particles remaining globular, and free from acrimony, they will from thence not only remain longer in the habit of body; but the stomach and bowels will be less injured, than by stimulating preparations of Mercury which have undergone a chemical process.

So effectual has *Mercury* been found in the cure of this disease, in the east Indies, when applied in this manner before suppuration of the affected part, that it is there deemed a specific. In dysentery and obstinate fluxes, likewise where the mesenteric

mesenteric glands were obstructed, it has been found of great service given as an alterative: In dropsies also brought on by intermitting fevers, or tedious chronic diseases, where the abdominal viscera were supposed to be affected; the use of Mercury, till it excites a gentle salivation, has been attended with good success; especially when assisted with *diuretics*, and in the conclusion, by the *peruvian bark* and *steel*.

In this climate, the Liver is more frequently affected with diseases of the slow, chronic kind, tending to produce a scirrhus which is often the consequence of hard drinking, or an intemperate, sedentary life; especially in those of a bilious habit of body, and hypochondriacal temperament.

A Scirrhus of the Liver, like a treacherous adversary, makes its approaches by such slow, insensible degrees, and with so little pain, that the patient often becomes incurable before he is aware of danger; but a pale, livid aspect, and bloated habit, indicate a visible decline in his health; and as the various functions of the whole abdominal viscera chiefly

chiefly depend upon the sound state of this organ; and since a confirmed scirrhus, instead of diminishing, has been found slowly to increase; it can be no wonder, that it generally proves incurable, and terminates fatally in *Dropfy*, *Consumption*, or cancerous disposition of the part.

A SCIRRHUS of the Liver is more certainly indicated by a fallow, olive-coloured complexion, than a yellow colour of the skin, which rather denotes an obstruction of bile, or the presence of gallstones.

IN the inferior concave part of the Liver it is difficult to be perceived; but in its convex part, on the right side, which is usually the seat of this disease; the hardness and enlargement, in thin subjects, is manifest to the touch: In this case, the patient is generally affected with *nausea and sickness after eating*, when the stomach is replenished with food, from the enlargement and pressure of the diseased Liver, by which its natural function is disturbed; and on the contrary, the fulness of the
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stomach will occasion pain and oppression about the region of the Liver, attended with difficulty of breathing and a cough.

EARTHY concretions, or a kind of chalky matter have sometimes been formed in the biliary ducts, and even in the substance of the Liver itself, the lungs and other spongy parts of the body; it is also subject to steatomatous tumours or such as contain a curd-like matter, and likewise those of the cancerous kind, whose corroding qualities, on dissection, have given it the appearance of a honeycomb.

LONG fasting, or abstinence from drink, violent perspiration, or ardent fevers, by depriving the blood of its fluidity, may dispose it to stagnate in the small vessels, and induce a scirrhus tendency of the Liver: Sudden fear, excessive grief, or poisons, by exciting spasm, and constringing the biliary ducts, may also have the same effect.

WE have remarked that morbid affections of the Liver, arising from obstruction, are sometimes terminated by bleeding piles, or a hæmorrhage from the nose: Such a discharge may be accounted for, by attending to the distribution of its vessels which receive their blood from the abdominal viscera, and are all concentrated in one common trunk, to be distributed through its substance: Hence, it will be evident, why the blood makes its way through *devious passages*, when it is obstructed in its natural course, and cannot circulate freely through its own canals.

VARIOUS, and almost innumerable have been the medicines recommended for removing *obstructions of the Viscera*; many of them possessed of efficacy, and others so inert and void of power, that it might be said with truth, their greatest excellence consisted in not being able to do harm.

As it is matter of real consequence to ascertain the effects of those medicines which, upon trial, have been found most efficacious; I shall mention
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such only; and endeavour to point out, under what circumstances, benefit may be expected from them, and upon what principles they are supposed to act; but I am far from thinking it possible, to account, in a satisfactory manner, for many extraordinary changes produced in the living body, either from the efforts of nature, or the operation of medicines.

ALTHOUGH Mercury is a medicine of acknowledged efficacy in local affections of the Liver, when seasonably administered in the beginning; there are cases where its use would be exceptionable and improper: For instance, when the patient is of a weakly *consumptive habit*, and labours under hectic fever proceeding from a *decay of the vital parts*; it has been found prejudicial; also in *tedious affections of the Viscera*, occasioned by a long course of intemperance, or hard drinking, tending to produce a confirmed scirrhus.

IN such chronic maladies, *alteratives* of a more gentle kind, as those of vegetables which act by their saponaceous, attenuating quality, are more
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safe and beneficial: Of this sort are *taraxacum*, (dandy-lion,) *succory*, *quick-grass roots*, and such as abound with a milky juice, which taken in fresh, runnet whey, during Spring and Autumn, are of greater efficacy than is generally imagined; especially when duly and long continued, as all alterative medicines ought, the more effectually to produce a gradual and lasting change in the constitution.

MILK is chiefly composed of three parts, namely, of cream or animal oil; curd or cheesy part; and whey or watery part; the last of which may be considered as a fine, animal fluid or serum separated from the grosser parts of milk, which easily mixes with the blood, and when rendered more aperient by the addition of *lixivial salt*, or impregnated with the attenuating juices of vegetables, is a safe and efficacious deobstruent, in obstinate obstructions of the Liver, and Viscera.

WHEY contains a sweet, saccharine part, and also an oily, saponaceous mucilage, from which it also possesses solutive, and attenuating qualities; and

and being friendly to the stomach and bowels, is proper to keep the body laxative when they are in a tender, excoriated state, and where harsh purgatives would be hurtful, or even dangerous. Whey will also be found extremely beneficial when the bladder, or urinary passages have been irritated and fretted by gravel or fabulous matter.

ALBUMEN OVI or white of fresh, raw eggs, is also a saponaceous, animal fluid of exquisite fineness, and similar to the lymphatic part of the blood; diluted with distilled water, or fresh whey, when liberally taken, it will generally *cure the jaundice*; and in weakly constitutions, has frequently succeeded in that disease when other means failed.

It has been observed, that when warm fluids had been injected into the intestines, or even into the abdominal cavity of living animals, not a drop could be found after death; the whole being absorbed by the lymphatic vessels. From this known fact, and by attention to the structure of the Liver, already described, this practical inference will follow, viz. that in all diseases of that organ,

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or those of the abdominal viscera in general; such medicinal substances as are appropriated to their cure, may be more immediately conveyed to the affected parts, by *clysters*, than any other means; for, being *absorbed by the lacteals, and mesenteric veins, they are carried directly through the Liver by the Vena Portæ*, and with this peculiar advantage, that, not being altered by undergoing the digestive force of the stomach, like medicines taken by the mouth, they will be transmitted to the seat of the disease, possessed of their whole medicinal properties.

Saponaceous Clysters, therefore, or *lixivated Whey* being injected into the intestinal canal, will there be absorbed and immediately conveyed to the Liver with the reflux blood which, as repeatedly observed, it receives from the abdominal contents. In this manner the deobstruent power of medicines will not only act with their full force upon the obstructed glands of the viscera, but by mixing with the blood and juices will render them more fluid and fit to pass through their finest strainers.

THE use of clysters, in this country, is not so common as in many parts of Europe, where they are frequently administered for refreshing the body, as well as in the cure of diseases: They have indeed, been mentioned among other remedies, in a general way; but their extraordinary efficacy has not been particularly insisted upon, nor have reasons been assigned drawn from the structure, and functions of the affected parts, why, particularly, in *diseases of the Viscera*, they will be found more powerful than other remedies. In the magnificent Hospital of *Santa Maria Nova, at Florence*, several years ago, I had an opportunity of remarking their good effects. They are by some named *visceral injections*, from their being peculiarly appropriated to diseases of the bowels; and as I have since, from repeated experience, been convinced of their exceeding benefit, in such cases; I could wish that this observation might be regarded with attention.

Absorption of fluids by the lymphatic vessels of the skin, being also found very considerable, and a fact no longer to be doubted, may suggest the use of a *warm Bath*, as another powerful

Remedy in scirrhus affections of the Liver, and glandular obstructions of the viscera. It has been experimentally proved, that the whole surface of a human body, in the space of fifteen minutes, may absorb near seven pounds of water: A *warm Bath*, therefore, will greatly assist in the cure of such diseases: Warm water when received into the system, by its relaxing power, will soften the obstructed vessels, and tend to dissolve their glutinous, impacted fluids; and those good effects may the rather be expected, considering its action on the skin as a *universal fomentation*, and the extraordinary sympathy between the surface of the body, and internal, vital parts, which has been particularly mentioned in the third Section of this Essay.

As the quantity of water imbibed by the *absorbents* will be proportionable to its lightness, and purity; that which is soft will be most proper for the purpose of a bath; and since most water contains a certain quantity of vitriolic acid, and earthy matter; it will be necessary to add a sufficient portion of soap, or lixivial salt to neutralize the acid, and render the water more pure, by precipitating its calcareous earth; consequently, it will become
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more penetrating and deterfive. A handful of elder-flowers may be thrown into the bath at the time of ufe, to give it an agreeable odour.

By coughing, sneezing, and other violent efforts of the body, particularly *vomiting*; the blood is driven through the whole vafcular fyftem with increafed celerity; *Emetics*, therefore, will alfo be of confiderable fervice, in chronic difeafes of the Liver; efpecially in cold, phlegmatic conftitutions; but they ought to be directed with great caution, and chiefly in cafes where the obftruction is recent, and the vital parts found; or at leaft, before the Liver is become fcirrhouf, and broken down. If this caution be difregarded; a *confirmed fcirrhus*, by being thus irritated and inflamed, may be converted into an *incurable cancer*.

EMETICS are alfo lefs proper in acute difeafes of the Liver, attended with pain, general inflammation, and heftic fever; but where the fymptoms are of the chronic kind, proceeding from fpafm, or fimple obftruction, with a defective fecretion of bile; they have been found of the greateft fervice; ef-

pecially, after the use of *alterative medicines*, and the warm bath, or those attenuants which have already been specified; for, by the action of vomiting, the Liver is not only strongly acted upon and compressed by the abdominal muscles, and surrounding parts, but, being contiguous to the stomach, is agitated and shaken by its repeated efforts.

By *vomiting*, and the agitation which the whole abdominal contents thereby undergo; the motion of blood through the viscera will be greatly increased; consequently, it will be more freely transmitted through the several, intricate, vascular systems of the Liver. Hence, a sea-voyage and its attendant *sickness*, by acting more permanently, and with greater power, as well as by the copious evacuation of bile which it generally occasions, may still have additional efficacy.

AN opiate, after the operation of the Emetic, will be necessary; particularly, in cases attended with pain, or in those of irritable habits: It usually promotes perspiration; consequently, by relaxing the
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the solids, and abating spasmodic constriction of the vessels, it may also assist in removing obstruction.

PURGATIVES, seasonably directed, will likewise have their use in cases of *hepatic, or bilious obstruction*; for, as the bile stimulates the intestines and naturally promotes their discharge; costiveness will generally be the attendant of such affections. It will therefore not only be necessary to direct gentle laxatives as substitutes for the deficient bile; but, in particular cases, occasionally to administer a smart purgative pill, with *a grain or two of calomel, and of aloes and soap, three grains each*, which, by its stimulus, may help to dislodge, and carry off those gross, stagnating humours from which diseases of the viscera so often originate; and such salutary effects may more reasonably be expected, as we constantly find, that in all disorders of the stomach and bowels, whether they are originally, or symptomatically affected, the patient is generally relieved by *spontaneous vomiting or purging*.

BESIDES, since *Purgatives* operate more immediately upon the alimentary tube which is connected with the affected parts, they will be more likely, by their stimulus, to *dislodge biliary concretions*, and give motion to the stagnating bile ; especially, as the common canal, through which the bile passes into the intestine, is formed by the union of the cystic and hepatic ducts proceeding from the Liver: This observation is confirmed by experience ; for we know, that, by such means, biliary concretions have frequently been voided.

IT has been experimentally found that *Electricity* accelerates the motion of fluids, and is a remedy of great efficacy in cases of obstruction, or whenever there is want of circulating power : A capillary tube which will only transmit water by drops, being electrified, will instantly allow it to pass in a full stream. Its effects on animal, and vegetable bodies are not less extraordinary ; in the first, it increases the blood's motion, as is evident from its raising the pulse ; and the growth of plants is remarkably promoted by it, as well as animal, and vegetable perspiration.

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CONSIDERING, therefore, the complicated vascular systems of the Liver, the infinite number of its vessels, and the *sluggish motion of their fluids*; there is no part of the human body more likely to receive benefit from gentle strokes of electricity, applied to the region of the Liver, whenever its vessels are obstructed, or the progress of its fluids preternaturally retarded; which will more evidently appear from the success of its application in cases of *obstructed menses*, and in *dispersing ganglions of the tendons*, or other hard tumours.

WHEN inflammation seizes the inferior, concave part of the Liver where the gall-bladder and its ducts are placed; a fixed, indolent, but deep-seated pain, with a sense of weight, and burning heat, is perceived on the right side; and the countenance is generally yellowish, or of a pale olive colour: The patient is often affected with *pain in the right shoulder*; much thirst, nausea with vomiting, and sometimes hiccough; although the *pulse, especially in the beginning of the disease*, is very little different from its natural state; a circumstance the more extraordinary as
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in most diseases where the vital parts are first attacked, the pulse suddenly intermits, and loses its firmness.

THIS *chronic species* of disease may proceed from any impediment to the secretion of bile in the Liver, and its free discharge from thence, through the biliary ducts into the intestinal canal.

THE principal of such causes are, *biliary concretions*, the immoderate use of *spirituos liquors*, *sudden fear*, or *mental anguish*; also *nephritic pains*, or violent irritation of the stomach and bowels, from the use of strong emetics, drastic purgatives, or poisons; for it is necessary to remark, that although profusion of bile is often a consequence of the last causes; spasmodic constriction of the gall-ducts has also been known to follow their use; so that the same cause may produce different effects, according to the state and condition of the body at different periods of time; or as the nerves of certain individuals are then affected by different sensations.

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THIS observation is particularly exemplified in the female constitution; where a fright or violent surprise which put a stop to the periodical flux in one person, shall occasion its profuse discharge in another. In like manner the *jaundice* may happen from *Spasim*, by immoderate grief, as I have frequently seen; and by poisons, or the like causes; which, for a time, produce a constriction of the gall-ducts, and prevent the passage of bile into the intestines,

EVERY disease of the Liver is not attended with *jaundice*, nor is every *jaundice* attended with a *diseased Liver*; even those occasioned by gall-stones, when the aperture of the gall-duct is not totally closed, are exempt from it; but in general, when its concave side is affected; the inflammation communicates itself to the contiguous gall-ducts, and obstruction of bile is the consequence, with yellowness of the skin, urine, and whites of the eyes; by a diffusion of that bile through the general habit, which naturally ought to have passed off from the Liver,

WHERE

WHERE *Gall-Stones* obstruct the biliary ducts, the patient feels an uncommon weight, and sickly; oppressive pain about the region of the stomach, chiefly on the right side, (at the heart, as he expresses it,) attended with nausea, vomiting and loss of appetite; he becomes indolent and inactive, as if deprived of his usual power and alacrity to move; and when the disease is of long continuance, daily loses flesh and strength.

BUT as such symptoms are common to other diseases, and therefore, equivocal and uncertain; it is necessary to distinguish them more truly, by pointing out those peculiar to this malady; the most certain of which are, a costive habit, and pale, clay-coloured stools; with yellowness of the skin, urine, and whites of the eyes.

THIS discoloration is generally preceded by burning heat and excruciating pain, near the pit of the stomach, on the right side; which is more or less intolerable, in proportion to the degree of obstruction, the shape, and magnitude of the stone
about

about to be voided, the constriction of the duct through which it is to pass, and the force with which it is pushed forward: Hence the duration and degree of pain will be different, in different subjects, according to the lax or tense state of the solids, and the irritability and sensibility peculiar to each: It will also be most violent when their fibres are put upon their full stretch, and the spasm greatest, by which stones are to be expelled; that is, when the gall-ducts re-act or endeavour to restore themselves, by the natural cohesion and elasticity of their parts.

If with those symptoms, the violent, deep-seated pains, have their remissions, and return as it were by fits, and are *succeeded by Jaundice, with a very slight degree of fever, and but little alteration of the pulse*; there is then the highest probability of gall-stones; and proper remedies should be directed without delay: So that it is chiefly by the concurrence of those *symptoms which are peculiar to biliary Concretions*, that their existence in the body can certainly be known.

YELLOWNESS of the skin is plainly a symptom or consequence of the pain which, in cases of passing a gall-stone, always precedes it; and which, although extremely violent, is scarcely, as observed, *attended with fever, or alteration of the pulse, as in other painful diseases; a circumstance so peculiar to this malady*, that it seems the very criterion or mark of distinction by which it may be more certainly known from all others. It may be asked, *why excruciating pain is not here attended with fever*; and why the patient in this disease is usually affected with pain in his right shoulder?

BUT the symptoms arising from the mere presence of biliary concretions, are very different from those which attend their expulsion; for, the first are of the indolent and oppressive kind; but the last have sometimes been so excruciating, and intolerable, as to produce fainting, and convulsions, or even, for a time, to deprive the patient of all sense and motion; but soon as the stone has made its way into the intestine, the painful symptoms vanish as if by a charm; although
he

he is languid, and feels internally the sensations of soreness about the region of the stomach, as after a bruise or fall.

THE exclusion of *calculi* is also usually attended with a *vast degree of flatulence in the bowels*, and distension of the stomach; and are voided with more ease in women, and those of lax fibres, or such as are delicate, than others of a contrary habit: An erect position is painful, but the patient finds ease by the deflexion of his body; and it may be remarked, that having passed large stones, should any still remain, he has less to dread in future, the gall-duct being now forced open and sufficiently dilated for their exit.

It should also be observed, that those *rigors* or slight shiverings which here affect the patient, and generally denote subsequent fever, or the formation of matter, in other diseases; are not, in bilious cases, followed by the same bad consequences; and withal, if such as are subject to jaundice have been sometimes laxative, instead of costive, as already mentioned; that may easily be accounted for, from the violence of pain acting as a stimulus

stimulus and exciting an expulsive motion of the intestines, even when they are deprived of their natural irritation from bile.

THAT stones have been frequently found in the kidneys and urinary bladder, we know from those who have experienced their painful effects; but that they *so often exist in the gall-bladder and its ducts*, or the Liver itself, and many other parts of the body, is a fact more remote from general observation; so that, till of late, the particular, *characteristic symptoms of biliary concretions* were very insufficiently known or attended to, either by the patient or physician.

Dr. Haller, with some of the moderns, believes that gall-stones, or as they are more properly called, *biliary concretions*, are much *more frequent even than those of the kidneys and bladder*; but as the first are expelled into the alimentary tube, and voided with fœces, they escape the patient's attention; and his painful symptoms are imputed to a fit of the bilious colic, or mistaken for other diseases; and it may be remarked, that
such

such as are subject to *gout, or gravel and stone* in the kidneys and bladder, are of all others most liable to gall-stones.

WOMEN also, at a *critical time of life*, from the change which then happens in their constitution, are extremely subject to *visceral complaints*, and among the rest, those proceeding from gall-stones; to which, according to the observation of *Hoffman*, they are much more subject than men; especially, when they use little exercise, and labour under anxiety of mind, that alone being sufficient to constrict the gall-ducts, and produce *yellowness of the skin and obstruction of the Liver*, which lately occurred to me in the case of a Lady I attended near Portland-place, about the time when a cessation of the periodical discharge might naturally be expected.

JANUARY 6, 1792, she perceived a movement or convulsive flutter in the abdomen, attended with a vast degree of flatulence and distension, from which she imagined herself pregnant. She complained of very acute pain, on her right side, ex-

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tending across the pit of the stomach, which generally returned about noon, with shortness of breath, giddiness of the head, and extreme low spirits; these symptoms always left her with a *hoarseness*, as if she had a violent cold: Her habit was costive, and the fœces pale; in a few days her *face became yellow*, and her urine was tinged with the same colour. Still perceiving the motion already mentioned, she persisted in the idea of being with child; although the symptoms clearly indicated an obstruction of bile, from gall-stones, or constriction of the biliary ducts; the last of which appeared most probable, as she had been much affected by the death of a near relation, and informed me, that during a short residence at *Madrid*, she formerly had a similar complaint, from anxiety of mind, though in a less degree.

I DIRECTED a laxative mixture to be taken occasionally, and every night an injection with soap and whey; she was requested to go into the warm bath when the pain was violent, and to take a small pill with one grain of opium. A bladder half-filled

filled with warm water, and wrapped in flannel was applied to the affected side, and she frequently took an emulsion of sweet almonds with lixivium of tartar and manna. By the use of these medicines she found great relief and abatement of pain; the yellowness of her complexion gradually disappeared, and, a few weeks after, she went into Northamptonshire for the benefit of air and exercise.

Biliary concretions are generally about the size of peas, or kidney-beans; but by authors of the most unquestionable veracity, we are told, they have been found of the enormous magnitude of a pigeon's egg, or even a walnut; so as in a manner to occupy the whole cavity of the gall-bladder, or its duct where they were lodged, and which has thereby been dilated to a vast diameter, so much as to admit the largest finger; and in cases where the duct was totally obstructed, the gall-bladder has been so enlarged and distended with bile, as to have been mistaken, by the touch, for the fluctuation of matter in an abscess of the Liver. A remarka-

ble instance of this kind may be found in the Edinburgh Medical Essays, vol. ii. p. 357, in a boy, injured by a fall, where eight pounds of bile were contained in the gall-bladder with enormous distension of that part.

IN some extraordinary cases, stones have been found in the gall-bladder, after death, without any morbid affection of the part having preceded: This, I think, tends to prove what I have already advanced, viz. that where *gall-stones are formed simply by concretion*; the Liver may remain in a sound state, and consequently be free from pain or local inconvenience, till they become so large as to obstruct the biliary duct.

SUCH concretion, from the smoothness of its surface, may not produce pain, but, like a stone in the urinary bladder, remain inactive, till put in motion by some *exciting cause* which renders the body irritable, and disposes the affected parts to inflammation, viz. intemperance or errors in diet, taking cold, or violent agitation of body or mind; for, excess of anger alone has been known to affect the Liver and produce *Jaundice*.

SOME

SOME have supposed, that gall-stones are formed by the coagulation of bile, from an *acid* in the intestinal canal, insinuating itself through the common duct into the gall-bladder; but this seems a vague and ill-founded opinion which neither corresponds with the *structure* and *situation* of those parts, or observations arising from the symptoms of the disease.

It would, for instance, be a very improbable conjecture, that an *acid fluid* should deviate from its course downwards in the large intestinal canal, and take a lateral direction, through the small biliary duct, even in opposition to bile flowing from the gall-bladder into the intestine.

BESIDES, if this opinion was true, it would then follow, that young people, who of all others, are most affected by *Cardialgia* or heart-burn, from a redundant *acid* in the stomach and first passages, would be more subject to biliary concretions than adults, which is contrary to practical experience; for, gall-stones have seldom been

found in young subjects, but, on the contrary, are frequent at an advanced period of life, where an acid seldom abounds.

THE bile when obstructed and diffused in a large and preternatural quantity through the general habit, being a heterogeneous fluid and foreign to the mass of blood, will dissolve it, and occasion *hæmorrhages*; and by its acrimony, bring on such an intolerable itching of the skin, that the patient can take no rest.

As Jaundice does not always happen from every morbid affection of the Liver; so it ought to be some consolation to the patient, that every species of jaundice does not indicate a diseased Liver; more particularly that which is occasioned by gall-stones, improperly so called,

ALTHOUGH those concretions may somewhat differ in their composition; the greatest part of them manifestly appear to be nothing but *inspissated bile* which, held to a lighted candle, will flame like coarse wax, and being generally *without a nucleus* or central basis, deserve not the name of stones.

BILE,

BILE, by a property common to all glutinous fluids in a stagnating state, will thicken and concrete by the evaporation of its fluid, and the mutual attraction of its groffer parts; consequently, *gall-stones may thus be simply formed, without any morbid affection of the Liver itself, or the parts peculiar to it.*

AGREEABLE to this observation, we find that those who lead an inactive, studious life, where the motion of cystic bile is sluggish and retarded in its progress into the intestines, are, of all others most subject to such concretions. As a farther confirmation of this reasoning; gall-stones have generally been found in the gall-bladder itself, where the bile stagnates, and not in its ducts where it circulates; and because, many who had voided gall-stones, afterwards remained in perfect health; which clearly shew, that, independent of tenacity, the bile, in such cases, may be free from depravity; and that its *simple concretion only is sufficient to account for the formation of gall-stones.*

THIS remark, however, should by no means flatter the patient with such perfect security, as to withdraw his attention from every possible method of preventing the disease which in advanced age, and a bad habit of body, is extremely apt to return; especially if he has been affected by *gout*, and *gravel*, or his constitution is much broken and impaired by intemperance, or preceding chronic diseases which hinder him from using sufficient exercise.

WE are informed by Dr. *Glisson* of a curious circumstance relative to this matter, namely, that in brute animals, particularly horned cattle, gallstones were much oftener found in winter, when they were fed on dry food, and stood still; than in summer, when they used exercise, and fed on green herbage; from which it was concluded, that *dry food, and want of motion* contributed to the formation of those *calculi*; and that they were dissolved by the power of exercise, and the saponaceous, attenuating juices of vegetables.

THOSE

THOSE who thought themselves affected by *gall-stones*, now began to eat grafs like quadrupeds; and *Van Swieten* tells us of a poor man whom he advised and encouraged to live almost wholly upon it, in hopes of a cure. He persevered in the use of it two whole years, the winter-months only excepted, and boiled large quantities of grafs in water sweetened wth honey, which was his common drink, and also in broth which was almost his only food; in short, he devoured such large quantities of it that the farmers drove him by force from their fields. By this method, we are told, he obtained a complete cure of a very obstinate jaundice, by which his *saliva was become bitter*; but we are not informed whether he voided gall-stones or not; although the same respectable author informs us he never knew an inveterate yellowness of the skin perfectly cured without the exclusion of those concretions.

THE veracity of the accurate and indefatigable *Glisson*, so far as it relates to facts, seems unquestionable; but the deduction from them does not, by any means, tend to establish or confirm the opinion, that
gall-

gall-stones may be dissolved by fresh vegetables. They might, indeed, be found in some cattle in winter, and others in summer be free from them; whence it may as reasonably be concluded, that those discovered in winter had perhaps been formed the preceding summer; and that, in such as were examined in spring or summer, and found free from them, they had never existed at all.

THAT particular kinds of dry, viscid food, without a sufficient quantity of fluids to dissolve and disjoin its parts, and the want of exercise, to agitate and keep such fluids in motion, may favour the formation of biliary concretions in the human subject, there can be no doubt; but since they have been found so difficult of solution out of the body, and many of them not to be dissolved at all, according to experiments accurately and judiciously made with solvents of the most powerful kind, as *soap-ley*, *lime-water*, *lixivial salts*, and the like; it is not probable, they will yield to such substances when taken by the mouth, and considerably divested of their natural qualities, by the digestive power of the stomach, and dilution with animal fluids.

SEVERAL

SEVERAL years ago, a medicine for dissolving gall-stones, was strenuously recommended. It consists of two parts of *etherial spirit of vitriol*, and one of the *distilled oil of turpentine*; the dose, fifteen drops or more, twice a day, or taken for a considerable time in clarified whey; but this, like other things given with the same intention, was not found to produce the desired effect; nor could any such consequence be reasonably expected from it; except by such as are less fond of truth than fair promises; of which, fortunately for quacks, impostors, and water-doctors, the number is not small.

BUT although, I believe, gall-stones are too far from the reach of medicines to be dissolved; experience proves *that they may be expelled*, and there is great reason to suppose *they might generally be prevented*: But, at all events, the painful symptoms proceeding from them will admit of relief, and they may *as certainly be discharged from the body, as those of the kidneys and urinary bladder*; notwithstanding the opinion of some authors of the first repute, who, scarcely half a century ago, declared them *incurable*; so imperfectly was their true nature, or rational treatment then known.

IF from repeated experience we are certain that biliary *calculi* have been expelled from the gall-bladder, by the simple efforts of nature, like those of the urinary bladder; there is *still greater reason to hope for a cure*, from the additional assistance of art; especially, as medicinal substances act immediately upon the stomach and alimentary tube with which the diseased parts sympathize, and are closely connected.

THERE is indeed reason to hope that such concretions may be more certainly expelled from the gall-duct, even than *calculi* from the kidneys, and urinary bladder; considering the shortness of the passage from the gall-bladder into the *duodenum*, compared with that of the *ureters* those long and narrow canals which must convey them, with the urine, from the kidneys into the bladder; and afterwards the great difficulty of their progress, thence, through the *urethra*.

THE pain and difficulty of voiding a gall-stone chiefly proceed from the narrowness and peculiar structure of the gall-duct, and its oblique direction; for,

for, it runs almost an inch between the coats of the intestine before it finds entrance into its cavity: Those membranous coats being firm, compact, and endowed with exquisite feeling, make great resistance to the progress of the stone, and renders its exclusion both difficult and painful. Hence, also, when the intestine or *duodenum* into which it opens, is distended by wind and fœces, or affected by any spasmodic constriction; the gall-duct, passing between its coats, will be compressed and shut up, and the flux of bile into its cavity, for a time, thereby prevented.

FROM this circumstance it will also appear, why a stone seldom passes, until the pain and spasm of the affected parts abate, and the fibres are relaxed; likewise why forcing medicines, or those of the heating kind, would then be improper and even dangerous; by adding to the irritation and painful distension excited by the gall-stone.

BUT although the diameter of the gall-duct is naturally little larger than that of a goose-quill; such is its structure, as to admit of dilation and allow gall-stones to pass which are
equal

equal in size to a pigeon's egg, and sometimes much larger ; of which many examples may be found in authors of undoubted veracity.

To account for this extraordinary dilatation, and how stones of such incredible magnitude could make their way through so narrow a passage, it is necessary to remark ; that this part, like the *ureters*, is composed of fibres which will allow of vast distension, if the force by which they are stretched be gradually applied ; as may also be observed in large, cold tumours, affecting the inhabitants of the *Alps*, which become of enormous bulk without breaking the fibres of the skin.

IN like manner the diameter of the gall-duct is capable of great enlargement, from the gradual motion given to the stone, by the impulsive force of the spasm ; and it is happy for the patient, since *gall-stones cannot be dissolved*, that although his sufferings from their exclusion are severe for a time, he may thence have reasonable expectation of lasting ease.

GALL-

GALL-STONES, when very small and smooth, may glide through their ducts unperceived; but being large, or angular, they are voided with extreme torture, which will be most exquisite when they are obstructed and stick in the very orifice opening into the intestine, this being a nervous part, and like its internal surface, endowed with great sensibility.

WHEN the stone is so large that it cannot advance, and totally closes the natural passage; the bile being obstructed, must then necessarily *regurgitate from the cystic into the hepatic duct*, and thereby ascending to the Liver, will be absorbed into the blood, as evidently appears by tinging its several fluids of a yellow hue; so that the skin, whites of the eyes, the urine and even the spongy parts of the bones have been found of the same colour.

ABOUT three years ago I was desired to visit Miss B. at *Islington*, affected with jaundice from deep distress of mind, in whom the *saliva* was yellow like saffron, and all the above symptoms appeared in a degree

degree more violent than I had seen before; this was the only patient I ever attended, in whom the disease became mortal.

As, in this case, the animal fluids in general, were become yellow, so perhaps might *the aqueous humour of the eye; and probably, objects seen through it, might appear of the same colour*; but I cannot truly ascertain the fact, although I was afterwards much dissatisfied, that a thing so long in doubt, and so good an opportunity to determine its uncertainty, should then have escaped my attention.

SHOULD the yellowness of the skin disappear, after the violent pain, and spasm which occasioned it, are gone off, and the *Jaundice* be thus terminated without the discharge of gall-stones; it has been supposed that the stone, if such it was, had then receded or fallen back into the gall-bladder: When this is the case; the patient has great reason to fear a future attack, which is likely to be brought on by some of the *exciting causes* already mentioned.

WHEN

THE jaundice is generally terminated by the exclusion of a gall-stone, a copious discharge of turbid urine, or profuse sweat, the hæmorrhoidal flux, or a bleeding from the nose.

IF all attempts to expel a gall-stone become ineffectual; the patient's health must suffer in proportion to the obstruction of bile: When it is only partial; costiveness, and redundant acid in the stomach and first passages, will be the consequence, attended with a fallow countenance and bloated habit: But if, unfortunately, the *obstruction becomes total*, the body will unavoidably waste and decline; for, without bile neither digestion, nutrition or the excretion of fæces can be duly performed: In this particular case, pills made of the *inspissated bile of animals* may be administered; especially that of the pike or eel, which is most deterfive. Under the preceding circumstances, the patient will also be subject to *hæmorrhages*, from that putrid dissolution of the blood, consequent of its absorption; which generally leads to an *incurable Dropsy*, or some other fatal chronic malady.

IN this state of disease it has been termed *black Jaundice*, and with great reason deemed incurable; for, although the gall-stone should at last be expelled, and notwithstanding that might have been the original cause of the disease; the blood being corrupted and the constitution broken; a cure can scarcely be expected, because the affected parts are unsound, and hastily tending to dissolution: In fact, what is called *black jaundice* is not a distinct malady, but only an *inveterate state of one and the same disease*, attended with a bloated habit, and change of complexion to a *livid hue*, from the extravasation of dissolved, putrid juices, into the cellular membrane, which will be most apparent on the surface of the body, under the eyes, and on the temples, where the skin is thin and the circulation most languid.

THE general treatment of *hepatic affections* being already laid down, it can only be necessary to specify that peculiarity of practice, which is required during the *excessive pain of voiding a gall-stone*.

WHEN

WHEN this pain is so excruciating as to bring on faintings, or convulsion; *Opiates*; the *warm Bath*, and *emollient*, *opiate Clysters* which diminish pain; and by their relaxing power counteract the spasm and stricture of the gall-ducts, are the principal medicines to be depended upon for relief; but if, notwithstanding, it continues excessively acute; the loss of blood, though by some deemed a doubtful remedy, is also highly necessary, especially in those of plethoric habits; for, by taking off the tension and turgescency of the vessels, and abating inflammation; the stone will be much more likely to pass; especially if the *warm Bath*, and *saponaceous*, *opiate clysters*, and *gentle laxatives with Castor oil*, are directed immediately after; and if either *emetics*, or *purgatives* should be administered, with a view to dislodge the stone; they will be most safe and proper when the affected parts have been thus mollified and relaxed, and the spasm abated by the preceding remedies: It is also here necessary to remark, that a grain or two of *opium*, with double the quantity of soap, will stay on the stomach when it can bear nothing fluid.

A *dangerous and prevailing error* is frequent among the common people who suppose every case of this kind to be a *colic*, and, for want of information respecting the true cause of such painful effects, unfortunately have immediate recourse to spirituous cordials, *ginger tea*, and the like, the preposterous use of which has been injurious to many: The intention may be good, but the consequence has often been *fatal*.

GENTLE laxatives are always proper in the cases already mentioned, of which an emulsion with Castor oil and manna seems the best; or fresh runnet whey rendered more solutive by damask-rose-leaves infused in it when hot, and to which, a sufficient quantity of manna may afterwards be added.

Whey reduced by evaporation to half its quantity, becomes more purgative and deterfive, by increasing the proportion of its oily, mucilaginous, and saccharine part to the quantity of serum, and, thus prepared, is perhaps one of the most gentle laxatives in nature.

THE neutral salts are also proper ; namely, *sal polychrest. tartar. solub. &c.* which have this good property, that having opened the bowels, they are not, like most other purgatives, followed by costiveness.

To remedy the troublesome itching of the skin, occasioned by the *diffusion of bile through the blood*; the warm bath will be proper, and plentiful dilution with nitre, which will promote its discharge by the excretion of urine ; the bowels should be gently opened with castor oil ; the almond emulsion, with gum arabic and the addition of an opiate may likewise be given towards night when the symptoms are urgent.

IF in treating on diseases of the *Liver and Viscera*, I have dwelt long and particularly on such as proceed from *gall-stones* ; it was because they more frequently occur than is generally imagined, and are every day mistaken for other diseases, to the great detriment of the patient's safety ; for, since *they cannot be dissolved ; it is from their expulsion only, he can reasonably hope for a cure* : If therefore, by

delay they acquire such magnitude, as to render that impossible; all his future expectation of being perfectly restored to health, must end in disappointment, and a *dropsy*, *consumption*, or some lingering, and incurable, chronic malady will unavoidably follow.

SEVERE pains of the stomach and bowels may, indeed, happen from various causes already specified, without the presence of gall-stones or jaundice; but where such pains return at certain periods, as it were by fits, and are deeply seated near the pit of the stomach, towards the right side, and followed by a fallow complexion, or yellow tincture of the skin; gall-stones are generally the cause; for in such patients as voided them, these symptoms have been observed almost constantly and uniformly to succeed each other.

It should likewise be remarked, that where the patient had been long troubled with a sense of weight and pain at his stomach, loathing of food, and frequent *sickness after eating* attended with costiveness; there is the greatest reason

reason to apprehend gall-stones, or *such a viscid state of the bile as tends to produce them*; and therefore immediate recourse should be had to such medicines, as tend to avoid the impending evil. If the conflagration cannot be extinguished, shall not greater caution be used to prevent the kindling fire? In trifles, people are generally assiduous to preserve their property; but respecting *health*, such is the indolence, or it may be said with more truth than severity, the senseless indifference of the human mind, that the true value of that inestimable blessing is seldom known, till it is either greatly injured, or irretrievably lost!

FARINACEOUS vegetables, and those of the acescent kind, ripe fruits, with pure, soft water for drink, should chiefly constitute the food of those subject to *bilious disorders*; for, it has been observed that the natives of the east Indies who live chiefly on rice, and drink water, are much less affected by such disorders than Europeans who indulge themselves in the plentiful use of animal food, and drink fermented liquors.

IN all cases where there is danger of gall-stones, or when they have already been voided and a return of the symptoms is to be feared; such regimen should be long and steadily pursued, assisted by exercise on horseback, and *alteratives of the mild, deobstruent kind*, which operate with the natural powers of the body, and without violence to the constitution: In those who are much infeebled by gout, or other chronic diseases, and unable to use exercise, it will be serviceable frequently to agitate the region of the Liver with the hands, and to rub the affected parts with hot flannels, or a soft flesh-brush; and to apply a thin bladder half filled with warm water to the side.

AN *emetic*, or *smart purgative*, should also occasionally be administered; as their irritation will promote the secretion and circulation of bile, and prevent its stagnation in the gall-bladder where biliary concretions are generally formed: In the conclusion, the Bath waters, and those of Tunbridge, or Spa, and peruvian bark with steel, will be proper to strengthen the general habit of body, and prevent the return of this formidable malady.

To

To recapitulate ; whatever may be the *Diseases of the Viscera*, which interrupt or suspend their natural functions ; if those vital parts are rather disordered, than broken down and destroyed ; the Remedies already specified will be likely to remove them, and restore the patient to health ; namely, the occasional use of alteratives, the mild, deobstruent power of lixiviated whey, soap clysters, and opiates, assisted by *Emetics*, *Electricity*, and *Exercise* ; the various powers of which and manner of their action on the human body have already been explained, except the last, upon which I shall not here enlarge, its salutary effects being amply laid down in the last Section of this Essay.

AFTER diseases of the *Liver*, those of the *Spleen* are next in order ; but the use of this organ being as yet imperfectly known, we are less able to understand or truly to investigate the diseases to which it is subject ; except from such of its morbid appearances, after death, as are evident to the eye ; namely, its preternatural *induration*, and *enlargement*, or its uncommon *diminution* : But these may rather be regarded as symptoms, than proximate

mate causes of the disease, which, considering our ignorance of the functions of this part, are often too remote for discovery.

THE *Spleen* or *Milt* is a blueish, spongy mass situated in the abdomen, on the left side, between the large extremity of the stomach, and short ribs; its figure is irregularly oval, convex next the ribs, somewhat concave on its side next the stomach, and about the size of a goose's egg, though its magnitude and figure is very different in different subjects.

It is formed by a congeries of vessels of every kind; namely, of arteries and veins, lymphatic vessels, and some nerves; and although anatomists have sought in vain for its *excretory duct*; it has notwithstanding been considered by some as a *gland*, to which the lymphatic vessels perform that office; and that they are even endowed with the power of *changing lymph into blood*.

THE Spleen, like the pulpy part of the liver, being sparingly supplied with nerves, is not susceptible of acute pain, and therefore seldom affected

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ed with inflammation; but being of a loose, spongy texture, and easily distended, it has sometimes been found enlarged to an incredible magnitude.

THIS organ is connected with the *stomach*, and also with the *pancreas*, by blood-vessels; and, together with the *omentum* and *mesentery*, sends a large quantity of blood to the *liver* for the secretion of bile; so that these parts have a free communication with each other, not only by the distribution of vessels, but the sympathy of their nerves.

THE human Spleen is not so cellular as that of quadrupeds, but, being extremely porous and delicate in its texture, may be compared to a fine sponge filled with blood, especially when the stomach, with which it is connected, is empty, for then it has been found large and turgid; but, on the contrary, it gradually becomes less and subsides, when its blood is pressed out by a full stomach; either from wind, or aliment which will occasion the *return of a large quantity to the Liver, for the secretion of bile*; consequently that fluid will be proportionate to the pressure of the stomach upon the contiguous

contiguous Spleen, and the quantity of aliment to be digested, or in other words, to the exigency of its use.

FROM due attention to this circumstance, I think it may, at least, be deemed a reasonable conjecture ; that the *Spleen is subservient to the Liver*, and that its principal use is to supply that organ with blood for the secretion of bile, as well as other important purposes. From this observation it will also appear, why those who are subject to bilious complaints should make sparing meals ; because, when the stomach is overcharged with food ; the bile will then overflow or be secreted in large quantity.

BUT if bile is essentially necessary to digestion, it may be asked how digestion is effected, in animals, without a gall-bladder ? In such animals, there is notwithstanding a plentiful secretion of bile in the liver, and a copious flow of that fluid into the intestines, by the *hepatic duct*, which answers the purpose of cystic bile, although not so bitter or exalted in quality.

SOME

SOME modern physiologists have ascribed to the *Spleen*, what the antients imputed to the liver, viz. *the property of preparing blood*, because red globules are said to have been found in its lymphatic vessels; and also because, in every animal having red blood, there is also a Spleen, and *vice versa*; but this inference does not, especially in the first instance, seem just or conclusive; for, even allowing globules of red blood to be formed in the lymphatics of the *Spleen*, as asserted; it should then follow, that every *viscus* having lymphatic vessels, in which particles of red blood were also found, might, with equal propriety, be deemed an organ of sanguification.

THE use of the Spleen would, perhaps, be best determined, by attending to that morbid change of constitution occasioned by its being *diseased*, or *consequent of its total extirpation* from the body; for, since we find a very remarkable alteration in the constitution of a *castrato* deprived of the *testes*; there is reason to conclude, that a preternatural alteration of body may also proceed from extirpation of the Spleen: Agreeable to this conjecture, when the *Spleen* is diseased, the *body wastes*; and
after

after its being cut out from that of a quadruped, the *liver becomes tumid, the secretion of bile is diminished, and indigestion, flatulence, and pain of the stomach* are the consequence:

THESE preceding facts lead, I think, to the following conclusion; that since from *extirpation, or diseases of the Spleen*, the body declines in health, and both appetite and digestion afterwards fail; *this organ is subordinate to the liver in the secretion of bile*, a fluid essentially necessary, both in quantity and quality, towards the health and well-being of the animal system:

It is true, indeed, that very different offices have been ascribed to the Spleen; but, such is the diversity of opinions, and some of them so vague, chimerical and opposite, that it may still be doubted whether the use of the Spleen be yet perfectly known:

SOME supposed that the Spleen was the *seat of mirth*, and conveyed *atra bilis* or black bile (the cause of melancholy) to the stomach; others imagined that blood, by stagnating in the
cells:

cells of the Spleen, was rendered fitter for the preparation of bile ; and others being disappointed in their researches as to its functions, trespassed so far on the design of provident Nature, as to suppose it had no use at all ; because animals survived a long time when deprived of it ; an opinion more absurd and unphilosophical than any of the rest : They might as well assert the *testes* are of no use, because *Eunuchs* can live without them.

THE *Spleen* being cellular, and as it were a fine, animal sponge full of vessels, may therefore be easily overcharged with blood, and become enormously bulky ; innumerable instances of which may be found in writers of observations, especially among the antients. Those of lax fibres, and a bad habit of body, who have long laboured under ill health, are most subject to diseases of the Spleen, which are often attended with bleeding at the nose, ulcers in the legs, eruptions on the body and other symptoms of scurvy ; and it may be necessary to add, that animals from which the Spleen has been cut out, are said to have become mangy, and gradually to waste in flesh and strength.

Dr. Stukely mentions a young man who died in *St. Thomas's Hospital*, in whom the Spleen weighed five pounds and four ounces; and *Hildanus* gives the history of a woman's case, in whom the *Spleen and Liver* were become so bulky, that she was supposed to be with child: But the most extraordinary enlargement of this organ is mentioned by *Skenkius* in his Observations, where such was its incredible bulk, that it weighed twenty-three pounds: After these, it would be unnecessary to add farther instances of its preternatural magnitude; and as we have observed that the Spleen is probably subservient to the liver, in the preparation of bile; it may more easily be seen how that organ will become diseased, together with the Spleen, by sympathy or consent of parts.

THOSE affected with diseases of the *Spleen* have a fallow, cadaverous aspect, and are usually of a saturnine, melancholy disposition; hence the words *Spleen and Vapours* have been considered as synonymous terms: They feel a sense of weight on the left side, near the short ribs, especially after meals; attended with head-ache, loss of appetite, flatulence

lence and all the symptoms of indigestion, with excessive dejection of spirits : But, notwithstanding what has been said on the enlargement of the Spleen ; cases have not been wanting where, on the contrary, it has been found reduced in its natural bulk, and almost totally wasted.

FROM the structure, and situation of the *Spleen*, and its want of an excretory duct common to other glands, its diseases are more remote from the power of medicines, internally administered, than those of the liver ; but as it has a free communication, by means of its nerves and blood-vessels, not only with that organ, but the *abdominal viscera* in general ; the same medical treatment will be proper ; with the addition of such external remedies locally applied as may prove serviceable in its obstruction or enlargement.

WHEN such diseases resist the long-continued use of alterative, deobstruent medicines ; *mercurial ointment* with the *hemlock poultice*, or one made with pulp of fresh briony root, may be applied to the affected part which should be kept warm, and

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frequently chafed with hot flannels which have received the fumes of *myrrh* and *gum copal* thrown upon hot coals, contained in a warming-pan, upon the lid of which the double flannels may be placed.

AN *Emetic* will now and then be proper to agitate the stomach which, by its *contiguity with the Spleen*, and the efforts of vomiting, may tend to open obstructions, and promote the discharge of that accumulated blood which is so apt to stagnate in its cells, when the stomach remains inactive and long empty, or is exposed to excessive cold; especially when there is not sufficient exercise to render it fluid.

It will also be necessary to keep the bowels laxative, and promote the secretion of urine, which may be effectually done by *lixivated whey with manna*, and occasionally giving nitre in weak broth or common drink. *Sal sodæ phosphorat.* in the quantity of one ounce dissolved in a pint of weak, veal-broth, or beef-tea, is also an elegant and gentle purgative, and less offensive to the taste or stomach than any other purgative salt

fact I know: The method of its preparation, and peculiar qualities, as a cathartic differing from the *sal sodæ*, were first mentioned by my ingenious friend Dr. *Pearson* physician to *St. George's Hospital*, and may be found in Dr. *Duncan's Medical Commentary*, vol. xiii. p. 405: It is only a tribute due to merit, to say, that they both may be numbered among the first of those who teach the *Science of Physic* upon rational principles, and practise it with the conscientious feelings of honest men.

IN morbid affections of the *Spleen*, the patient has been observed to have a copious discharge of *urine*, and *saliva*, both which are manifest signs of *obstructed perspiration*: Vomiting of blood is not an uncommon symptom in such cases; and the *bleeding piles* have generally been attended with relief. The method of cure is so similar to that already laid down in *hepatic diseases*, that it is not necessary to specify their difference. In general, those medicines which *promote a free distribution of blood through the viscera, and increase perspiration, are the most likely to afford relief*; and as in all cases of general obstruction, those of the

mild, alterative kind, with exercise, will also here be proper. In the conclusion, after the fulness and sense of weight in the affected part are removed; peruvian bark, steel or the chalybeate waters of *Islington, Tunbridge, and Spa*, with the cold bath, will be necessary to finish the cure and prevent a relapse.

THE patient, during the use of these medicines, should breathe a dry, pure air, and constantly ride on horseback; for, such exercise by gently agitating the whole abdominal viscera, and promoting a free circulation, will greatly assist in the cure of all diseases proceeding from obstruction.

ABOUT four years ago, a gentleman of middle age, and bilious constitution, complained of an indolent, deep-seated pain in his left side, apparently in the *Spleen*, with which he had been affected for upwards of two years, especially in the winter-season, after late hours, or the least cold. He had taken many medicines, without much relief. I directed him the remedies already mentioned, and a pill to be taken every night,

night, with *sulph. præcip. antimon.* three grains, *calomel* two grains, well triturated together, with the addition of half a grain of *opium*: Half a pint of the strong decoction of *taraxacum* was also taken twice a day. I advised him to wear flannel under his shirt and to use exercise on horseback. By the use of those medicines, which he took by intervals, about seven weeks, he was free from pain, and has since remained in health, without any return of his complaint.

THE structure of the *Omentum* having been explained, and its unusual *extenuation or defect of fat* remarked as a cause of visceral disease, at p. 189; the following extraordinary case, for which I am indebted to a medical friend, might more properly have there been mentioned as an instance of the opposite extreme, namely, its *preternatural accumulation*; but, as it may be a caution for others to avoid the causes by which this uncommon disease was evidently produced, I cannot here omit the recital of it.

Case of diseased Omentum, and Mesentery.

THE life of the patient was sedentary from his earliest youth : At school, during the hours of play, his time was spent in his father's study in close application to the languages ; so much that his attention was lost to almost every other matter. This way of life was probably the cause that, at the age of fourteen, he was reduced to a very emaciated state, attended with night-sweats, *bleeding at the nose*, upon the least exertion, and frequently, while in a *leaning posture* over his books, which continued to a very alarming degree. Relaxation from study, gentle exercise, better air than that of a large town where he then lived, milk diet, and proper medicines relieved him at that time from his declining state, and he enjoyed tolerable health and good spirits till near twenty, when he resided in London ; but immoderate application to his favourite studies, business and its confinement, again brought on his old complaints, with the addition of a violent cough as well as night-sweats, and in the day-time, immoderate perspiration upon the least motion, though in the winter-season.

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These symptoms and an almost continual hectic fever reduced him to a shadow and the weakness of an infant; nevertheless the bark, change of air, gentle exercise, and milk diet once more restored him, and he again enjoyed health and spirits till within a few months of his death. He had accustomed himself for some years before to drink *large draughts of small, cold liquors*; took very little regular exercise, but sometimes indulged himself in very long walks, of twenty or thirty miles in a day, confining himself as usual, closely to business or study.

SOME time in the month of April, 1785, after walking fifteen or twenty miles hastily, and in danger of being benighted, he was seized with a pain on the left side, a little below the short ribs, which affected his breath and prevented his standing upright; but which he thought so little of as not to apply for medical assistance, but sought his remedy in abstinence, small drink, and rest in bed which in some measure relieved but did not entirely remove his pain.

EARLY in the month of June, the part, lately the seat of pain, began to grow hard to the touch, and very soon increased to nearly double the size of a hen's egg, not equally nor projecting, but in some parts very hard, yet without the least pain, even when pressed by the finger. He suspected no serious consequences, in its beginning, or progressive enlargement which was now rapid, till he began to have frequent *spasms* in the left thigh upon walking.

JUNE 22, Dr. B. who had prescribed for him, wished him to see a surgeon, and the late Mr. Pott visited him, but gave him up entirely to the physician: The plan then recommended was, small doses of *Mercur. dulc.* every night, with tonic medicines, and occasionally gentle purges.

JUNE 26. Another physician was called in consultation, and perseverance in the present plan was recommended: He began now to be almost incapable of walking from an attack of violent cramp or spasm, about the middle of the left thigh,

thigh, which increased in frequency and violence daily, infomuch that he could not turn in his bed. Various embrocations, volatiles, and opiates, were applied without the least benefit; one, with a strong solution of camphor, he thought increased his pain; but that with a solution of opium seemed to afford him some little ease.

A VARIETY of internal medicines were tried without the smallest good effect; the tumour by this time had extended itself lower than the *umbilicus*, and across the right side. The left leg now began to be œdematous round the ancle: Worn out with pain, he seemed inclined to try his native air, and went into *Berkshire* July the 23d. He bore the journey (40 miles) much better than was expected; but the spasms in the thigh became so excruciating upon motion, or on attempting to lie down, that he was forbid the comfort of his bed for near three weeks while he was in the country, during which the dropsical swelling in the leg increased, till not only that, but the thigh to the belly, was much loaded. At *Reading*,
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by direction of Dr. T. the *extract. cicutæ* was given in large doses three times a day, but without any apparent advantage.

AUGUST 13, he returned to town; disappointed in his hopes from the air; and, being now much swelled in the belly, in full assurance of relief from being tapped. The right leg, from great pressure of the tumour above, began to be much distended, as well as the *parietes of the abdomen*, which was enormously enlarged. During the whole progress of the disease, he passed very little urine; and at this time hardly any. About the middle of August, the spasms of the thigh nearly left him; but even when they had been most violent, he always found much relief from the application of cold, and many nights sat almost naked for ease.

AFTER his return to town, some medical consultations were held upon his case, but to no purpose. *Opiates*, the dernier resource for pain, had been gradually increased, till he took 70 or 80 drops of the *tinct. theb.* three or four times a day, and *tinct. cantbarid.* two ounces a day, with design

design to increase the secretion of urine. The bowels were equally inactive as the kidneys, for, he seldom had any evacuation except from art, which was often attended with a tormenting *tenesmus*. The last few days of his life, he on a sudden, after leaving off all medicines, *passed a great quantity of urine*, three or four times in the twenty-four hours. It would be useless to enumerate the several medicines used during his illness; it is sufficient to say, that those of the most active kind, and all that experience or judgement could suggest, were most assiduously applied, without any diminution of the size of the abdomen, till September 29, when he died,

ON *Dissection*, the right umbilical region being punctured by a trochar, there was a discharge of a thick, sanious fluid in the quantity of a half a pint. Upon the removal of the abdominal integuments, a very *large unequal tumour* presented itself, occupying chiefly the left *hypocondrium*, extending upwards as high as the stomach, and downwards as low as the bladder. Its surface was covered with extravasated blood, especially on its anterior, prominent

minent part, where it was not unlike an ulcerated fore, discharging ichorous matter. The superior part of the tumour was formed by the *Omentum*, very considerably enlarged and *replete with fat*, and adhering to all the contiguous parts. This being removed, the *diseased mesentery* appeared, *which was become an indurated mass of a large size, weighing twelve pounds*: The *colon* and intestines were become of a livid colour. The right kidney was natural as to size and shape, but the *left* had entirely lost all appearance of its usual form, and was almost totally wasted.

THE stomach, pancreas, and spleen, appeared sound, but the two latter were somewhat smaller than usual. The liver had no preternatural appearance. The urinary bladder was *thick and contracted*: The contents of the *thorax*, as to situation and appearance, were natural, except some few adhesions of the lungs to the *pleura*, and the heart being smaller than usual.

September 29, 1785.

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THIS singular case tends to illustrate and confirm several observations in the preceding part of this Essay; particularly, the inconvenience of a sedentary, studious life; the danger of drinking cold liquors when the blood is heated by exercise; and the great injury to health, by sitting constantly in a half-double position of the body, by which the abdominal *viscera sustain almost its whole weight, and being violently compressed, the circulation of blood through their vessels is obstructed, and the several secretions, and excretions necessary to life, impeded or suppressed.*

THE case of the late *Sir Joshua Reynolds* is another instance of the bad consequence of an *inflected position* of the body, to which his occupation constantly subjected him; for, on dissection, the *liver* was so enormously enlarged as to weigh *several pounds.*

S E C T.

S E C T. VIII.

Diseases of the Kidneys, the Bladder, and urinary Passage; viz. Strangury, Obstruction, and Incontinence of Urine; with the most effectual Means of their Cure. — Of the Gravel, and Stone, with a brief enumeration of the Medicines recommended as Solvents, and a comparative view of their efficacy and solvent power: Also occasional observations on the salutary effect of sparry water; and on the New Theory respecting the formation, composition, and cure of the stone; with general inferences from the whole.

IN this Section are contained such useful, and interesting, practical facts, as may enable the Reader to judge of the nature, and degree, as well as the relief, and cure of diseases affecting the *Bladder and urinary Passage*; more especially those which proceed from the *Gravel, and Stone*, being the most distressing of all human maladies; for, while the patient's body is worn out with pain, his mind is alternately agitated with hope and

and fear which exhaust his spirits and weaken the powers of both; at one time, confiding in medicines called *solvents*; at another, despairing of their efficacy, and dreading *Lithotomy* as his last resource,—the most painful, and precarious of all surgical operations.

BEFORE we proceed farther, it is necessary to take a concise view of the *urinary Passages* or affected parts; but so far only as it may be requisite to afford the Reader an idea of their structure and situation; as the extent of this Essay, of which, the present subject only makes a part, will not allow of more.

The *urinary Passage* commences at the Kidneys, and is extended through their ducts, called *ureters*, into the Bladder; and thence to the extremity of its canal called *urethra*, where it terminates.

THE *Kidneys* are two small glandular bodies placed in the posterior part of the abdominal cavity, and are intended to secrete or strain off urine from the mass of blood: Each Kidney appears to

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be a congeries of blood-vessels which ramify minutely through its substance; of lymphatic vessels, and some small nerves: They receive their blood from the emulgent artery which divides and subdivides into branches infinitely small, till they approach near the centre of the Kidney, where they converge, and being collected into parcels covered with a fine membrane, they form several *small cones* or nipples, at the points of which their orifices open, and as so many filtrating tubes, strain off urine, which transudes from the points of each cone, and drops into a small membranous cell or funnel called the *pelvis* of the Kidney: From this cavity the *ureter* originates, which is a slender pipe, of unequal diameters, about the size of a common quill, and is composed of a thick *nervous membrane* internally beset with small glands, which secrete *mucus* to defend it from the acrimony of urine continually passing through it from the Kidney to the Bladder; into which it does not directly open, but *runs obliquely between its coats*, and in the same direction as that of the gall-duct, where it opens into the *duodenum*; as has been already described in speaking of the Liver.

THE *Bladder* or receptacle of urine is placed at the bottom of the abdomen, within the bones of the pelvis; and is composed of three coats; the first being *membranous* derived from the peritonæum which connects it to the intestine called *rectum*; the second is *muscular* and made up of fibres intricately disposed and running in various directions: The inner coat is *nervous*, and, like each ureter, supplied with glands which secrete mucus to defend this sensible part from the sharpness of urine. The *Bladder* is amply supplied with arteries, veins, and nerves: It has three orifices, two of which are made by the *ureters* which bring urine into its cavity from the kidneys; and at its neck is placed the third orifice for the discharge of that fluid through the *urethra*, where also is a small muscle consisting of circular fibres, called *sphincter* which by its contraction, prevents the involuntary discharge of urine.

DISEASES of the Bladder, and urinary Passage may proceed from a *fault in the original structure of their parts*; the *effects peculiar to old age*; *external violence*; from *irritation of Gravel and Stone*;

or, what is more frequent, from *old, venereal reliques*, or the means to remove them by acrid, and astringent injections, irritating bougies, or other pernicious applications.

A long and painful *retention of urine*; the *sudden suppression of bleeding piles*; the *immoderate use of mercury, turpentine, or Spanish flies*; and the deposition of *sharp, scorbutic salts* upon the Bladder, or a *translation of febrile matter to that organ*, by exciting pain and inflammation, have all been observed to injure the urinary Passages; so that some of their diseases are *local*; while others may be considered as *symptomatic* or *adventitious*, proceeding from a fault of the general constitution.

ORGANICAL diseases, from a preternatural conformation of the Bladder or its contiguous parts, not being frequent, and seldom admitting of cure without surgical treatment, do not here require consideration; and although such as are the effect of advanced age, may not be wholly removed, they will, nevertheless, admit of relief, to the great comfort of the patient.

Strangury

Strangury and Obstruction of Urine are often the consequence of *inveterate gonorrhœas* frequently contracted, and imperfectly cured; especially those which creep up the urethra and reach the prostate gland, or neck of the Bladder; such affections being attended with so much pain and inflammation, as to bring on *ulcers, strictures, and caruncles*; or even an *enlargement of the prostate gland*, which, by compressing the *urethra* may occasion an obstruction of urine. The unseasonable use of *astringent injections* which shrink up the tender lining of the urinary canal, and lock up the *virus*, or those of the acrid kind which inflame it; also the frequent introduction of *irritating bougies*, or too much violence used to force a passage into the bladder, have all done great harm which might have been avoided by more gentle treatment, and the previous use of the lancet, emollient, opiate clysters, and the warm bath.

As to the specific qualities attributed to particular injections, bougies and the like; it may be remarked, that the milder their composition, the more beneficially they will act; for, such is the sensibility of the fine, nervous lining of the *ure-*

thra, that even milk thrown up with violence will painfully affect it; and as to bougies, since they act by their gentle pressure, and not by a specific power, such as are made simply of oil and wax are the best; for, even these will stimulate so much as to bring on a copious discharge of mucus. If it is introduced too large, it will create violent pain by the over-distension of the part, and defeat its own purpose; and it is necessary to observe, that the resistance which it always meets with from the prostate gland, even in a sound state, has often been *mistaken for a stricture* or morbid cause.

THE method of treating an *obstruction of urine* must be varied according to the causes by which it is produced: If it arises from any violence creating local pain and inflammation which shut up the urinary passage; bleeding and laxatives will be proper; after which an anodyne emulsion, or linseed-tea may be given for common drink: an emollient clyster with mallow-leaves boiled in milk may also be administered, and for nourishment the patient may take veal-broth, with nitre, or small quantities of any simple food void of seasoning.

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THE warm bath may likewise be used ; but if the symptoms do not speedily give way to such treatment, the urine should be drawn off by the *catheter* without delay ; for whilst it continues to collect in the bladder, and cannot be evacuated, relief from any other method would be expected in vain. However, it may be laid down as a general rule that all diseases of this part proceeding from *gravel*, or a *scorbutic*, gross habit of body, can only be remedied by such diet and medicines as are proper in those disorders, and restore the blood to its natural state.

Incontinence of urine or a want of power to retain it the usual time, often arises from debility and weakness of the sphincter-muscle which naturally contracts the neck of the Bladder and closes its orifice ; it may also happen from the passing of a large stone which has so much dilated its orifice, that the urine involuntarily escapes ; or from an *ulcer* which has eroded and partially destroyed the urinary canal ; and however contradictory it may appear ; a long, and painful retention of urine, by over-straining the fibres of the Bladder, may so weaken its retentive power, as

to produce the contrary extreme, and at last occasion its *involuntary discharge*, or sometimes, even a total suppression.

THE urethra in females being much shorter and dilatable than in males, affords an easier passage for a stone from the bladder; but if it is large, a temporary incontinence of urine is often the consequence. I was called in haste, to a Lady in *Scutb Audley-street*, who laboured under a total obstruction of urine, and as I found she had been *subject to Gravel*, there was the greater reason to suppose her disorder proceeded from fabulous matter, or a Stone lodged in the neck of the bladder: The pain was excruciating, and her efforts to pass water repeated and violent, but in vain: A large quantity of urine was drawn off by the *catheter*; after which she became easy, and by the use of emollient injections, and plentiful dilution, before a warm bath could be prepared, she voided a smooth Stone, about the size of a horse-bean, and has since remained in good health.

THE celebrated *Tycho Brahe* attending the Emperor of Germany in a coach, and retaining his urine too long, forfeited his life to his false delicacy.

IF *Incontinence of urine* arises simply from weakness and relaxation of the parts; a strong infusion of peruvian bark may be taken in quantity of a tea-cup full twice a day. Jellies, and nourishing diet are proper; the patient should drink Pyrmont, Tunbridge, or Islington waters, and make use of the cold bath at the same time.

ON the contrary, *urine* too long retained, or unduly secreted may prove hurtful both by its quantity and quality; the first will destroy the tone of the bladder; and when by heat, or long stagnation, its salts, and oil, are become highly acrimonious, they may erode its internal coat, and occasion *strangury*, *inflammation* and *ulceration*; or being retained in the blood, and falling upon the brain, may produce fever, delirium, or death.

THE expulsive force as well as retention of the urinary Bladder will be proportionate to its capacity and the elasticity of its fibres. At an *advanced period of life*, the fibres are more rigid and compact than in young subjects; and being also now less elastic; its power of retention, as well as its expulsive faculty will be considerably impaired; consequently, the patient will have a more frequent inclination to pass urine than before, and less ability to effect it.

THERE is also another mechanical change in the general habit brought on by age, not usually remarked, which will add to the former malady; viz. all the parts of animal bodies being much *less vascular in old age*, than in youth; in the first, the skin will become more compact and imperspirable; consequently, as the lessening of one discharge tends to increase another, in order to preserve a due balance between the solids and fluids; a larger portion of perspirable matter ought to be carried off by urine to compensate for the defect of perspiration; but here it is directly the contrary; for, as the fine urinary tubes of
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the kidneys must participate of the general effect of age, and being now *less vascular and more contracted*, they cannot so freely transmit urine as before; so that the perspirable fluid will become redundant; and, being increased from intemperance, taking cold, or other accidental causes, may bring on a bloated habit of body, followed by *difficulty of breathing, swelled legs, or dropsy*.

IN this state of the constitution, aliment of the fluid kind is most proper; with such things as relax the solids, and as it were lubricate and mollify their rigid fibres: Of this kind is the warm bath, flannel, or *fleecy hosiery* worn next the skin, broths slowly prepared, milk diet, thin chocolate, and the plentiful use of ass's milk, or emulsions with manna and nitre, which are not only balmy to the urinary passage, but will pervade and soften the contracted urinary tubes, and also keep the bowels gently open.

AN *Ulcer of the Bladder* is a disorder of the most distressing kind, and extremely difficult of cure; especially in bad constitutions where the patient is
far

far advanced in years ; for, the bladder being constantly either filling with urine, or contracting for its expulsion, the parts do not remain long enough in a state of rest, to recover the injury sustained, or allow the sore to heal. The same general causes as those producing pain and inflammation, sometimes terminate in an *ulcer* ; hence too much caution cannot be used, in disorders of this kind, even when at first apparently slight ; for, many instances might be brought to shew their unfortunate event, when long neglected.

WHEN this disease arises from scorbutic acrimony, or a bad state of the blood, it is generally inconsiderable in the beginning, commencing with a sense of heat, and indolent pain at the lower part of the belly, but at length is attended with *strangury* or frequent endeavour to make water. The urine is not only voided with difficulty, in small quantities, but mixed with mucus, and sometimes with blood and matter.—I attended a Lady, who, by a fall from her horse, was thus affected for several months, but at last entirely recovered.

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THE like methods and medicines are here proper, as those mentioned in a painful suppression of urine. The almond emulsion, or a solution of gum arabic in lime-water, with a third part milk, may be taken for common drink, and the patient should abstain from wine and fermented liquors. If the body is costive, half a pint of fresh new-milk whey, sweetened with manna, will be proper to remedy that inconvenience.

BALSAMS of the terebinthinate kind, commonly used in the early state of this disease before the inflammation is abated and the ulcer disposed to heal, have been found to exasperate the disease by their heating quality.

THE patient should confine himself to a light, abstemious diet of milk, vegetables, honey, and ripe fruits; with a little animal food, jellies, or veal-broth by turns. He should abstain from things salt and high-seasoned; from mustard, pepper, &c. and also from tarts or acid liquors. Ass's milk with Bristol water and goat's whey, or Seltzer water

water and milk, are proper ; also a strong decoction of sarsaparilla, in the quantity of half a pint, twice a day.

WHEN the pain and irritation are violent, an opiate clyster made with the decoction of three or four white poppy-heads, and elder-flowers, may be injected milk-warm, which will cherish the affected parts, assuage pain, and produce the effect of an internal fomentation.

Diseases of the Bladder and urinary Passages proceeding from *Gravel and Stone* are so slight in their beginning, that, like most others, they are then disregarded; although that is the time when many of those grievous symptoms which afterwards afflict the patient, and often put a period to his life, might be prevented, by medicines which would destroy the slight union of the gravelly particles and *carry them out of the body, before they so strongly cohere, as to form a stone*, on which they would afterwards have little effect : This observation is of the utmost consequence to all those who spring from nephritic parents, and
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whose complaints are *hereditary*.—*Sudden death is horrible to human feeling ; but those things which certainly kill by degrees, pass unregarded !*

THAT the rudiments of a stone pre-exist in urine, even in the most healthy constitution, will hereafter be evident; but why those *calcareous molliculæ* have so strong a tendency to unite and cohere in some; and in others never coalesce or concrete at all, but are discharged in the urine, without injury, it is difficult to determine: There must be an existing cause; but who shall find it out?

THE causes of many other diseases are equally obscure: What know we, except from its effect, of the deadly nature and essence of that poison concealed in the saliva of a mad dog; or why it almost uniformly produces in the patient a *dread of water*; and then in four or five days destroys him, after lying dormant and inactive in his constitution as many years? By what peculiar power do the *Gout, venereal Lues, and cancerous matter* produce their various symptoms, according to the specific difference of their several causes? and what is the nature of the *Plica polonica* which occasions
the

the hair to become bulbous, to twist and swell, and instead of its proper juices to transmit blood, with exquisite torture? Our enquiries are involved in the same obscurity when we endeavour to discover the cause of *Diabetes* or immoderate and preternatural flux of urine, so often incurable; and why, contrary to its natural quality, it should, in this disease, contain a large portion of saccharine matter or *real Sugar*, even to the quantity of one ounce, in a pound of that fluid. The causes of *magnetism*, or *properties of the sensitive plant*, may, perhaps, be as easily found out. The morbid appearances of the parts, after death, oftener present us with the effects, than the proximate causes of diseases.

Stones or concretions have not only been found in the kidneys, urinary Bladder, and receptacle of bile, but almost in every part of the human body: By dissection, they have been discovered in the *pancreas*, and *spleen*; also in the joints of those inveterately affected with *gout*; tubercles or stony concretions have been coughed up from the lungs of consumptive patients: They have

have been found in the *tonsil*, and *prostate glands*; and sometimes even in the brain and heart; as appears by the case of the Emperor Maximilian II. who had been afflicted with gout, and in whose heart were found several stony concretions. That vascular cake called *placenta* which serves as a medium of intercourse between the mother and *fœtus in utero*, has been beset with these extraneous productions, and instances may be seen in practical writers where stones have also been found in the kidneys of *new-born infants*.

THE progeny is known to inherit the *stamina* of the parent original, as much as similitude of feature, complexion, or natural temperament, which entail on each individual a *perishable or permanent tendency*; and this is particularly exemplified in *consumption, and scrophulous diseases*.

ACCURATE and repeated observations tend to prove that the nature and quality of animal fluids depend more upon their secreting organs, than the fluids from which they are strained off; and
consequently

consequently Gravel, like the Gout, is often a disease manifestly *hereditary*, and may proceed from a *vitiating construction of the kidneys, derived from the parent*; a defect, therefore, in the function of those organs may dispose them to form concretions, or in other words to favour the union of stony particles.

THAT the nature of fluids depends chiefly upon the strainers through which they pass, is evident in *vegetables*, where plants placed in the same vessel of water, will, by a kind of elective power, prepare juices of different qualities, according to the specific difference and peculiar disposition of their several strainers; and this faculty inherent in the stamina of animals and vegetables, if we may reason from analogy, is farther illustrated in grafting the branches of one tree into the stem of another; for, the juices of the last, will thence be so far divested of their natural qualities, by passing through different strainers, as only to produce the same kind of fruit, with that of the tree from which such ingrafted branches were taken.

ALL water is more or less impregnated with earthy particles, and being largely and frequently admitted into the animal body; whilst its several organs are vigorous and preserve their due energy, so long such rigid particles will be transmitted through their strainers and carried out of the body; especially, by the excretion of urine; but if on the contrary, their natural power is impaired by age, or chronic weakness; such stony particles will then be retained in the habit, and not being subdued, but remaining unchanged and invincibly the same, will coalesce and unite by simple attraction, and form Gravel in the Kidneys, Stone in the Bladder, and calculous concretions in the joints; all which, from examination, appear to be similar; so that the *Gout and Gravel may justly be deemed diseases nearly allied to each other.*

THE principles or rudiments of a stone, therefore, pre-exist in the urine of every individual whether healthy or otherwise; with this particular difference, that where the vital power of the kidneys is wanting, and consequently, where they are *suffered to separate from it, and concrete; gravelly mat-*

ter is then formed: But, on the contrary, when they are constantly expelled, in perfect union with the urine, no bad consequence ensues.

IN confirmation of this circumstance; the sudden separation, and concretion of this fabulous matter in fresh-made urine, so remarkable in some individuals, is the *most certain and unerring indication of a strong tendency to Gravel and Stone, and often proceeds from an hereditary cause* or natural defect in the function of the kidneys, peculiar to such individuals; although, upon dissection and examination of the organical structure in those parts, this cause would, perhaps, be as little evident, as that of *scrophula, or hereditary insanity*.

THAT Stones are formed by accretion or the simple attraction of earthy particles to a *nucleus* or solid, indissoluble basis has been proved by an experiment of the celebrated *Nuck* who, through an incision into the bladder of a living dog, introduced a small wooden button, where it was suffered to remain for several weeks, and after
killing

killing the animal, being then extracted; was found covered with a crust or shell consisting of *stony matter*.

THIS disposition to form *calculi* is farther assisted, by the preternatural secretion of that *animal glue* proceeding from the mucous glands, with which all the urinary passages are naturally supplied from their origin to their termination; to defend them from the acrimony of urine; and which will always be secreted in quantity proportionate to the stimulus applied to their internal, nervous lining, beset with those *glands*: This *mucus is always a consequence, but never the cause of Gravel or Stone*, otherwise than as it may contribute to cement, and bind their particles together. — I have seen such animal glue, constantly discharged with Gravel, and being found with it in urine it has falsely been deemed the cause of a Stone, and often *mistaken for purulent matter*; the marks of distinction between which will hereafter be specified, and pointed out.

WANT of due exercise, or inaction of body, disposes it to *Gravel*: This cause is manifest in those subject to fits of gout, and in rickety

children ; or when by fractures, or other violent injuries, the patient is long confined in bed, lying on the back, a position which compresses and inflames the kidneys, and prevents the secretion of urine.

THE constant use of *hard, spring-water* impregnated with stony particles, has also been supposed the frequent cause of Gravel and Stone, and indeed, at first, with appearance of reason ; but on examination of facts relative to this subject, however extraordinary it may seem ; experience shews, that hard, spring-water in which calcarious earth most abounds, is not more apt to generate Gravel in the Kidneys than that which is more soft and pure, but on the contrary, has been found *beneficial*. — In *Holland*, no hard waters can be drank, but on the contrary, from the nature of soil and situation, those which are soft and muddy ; yet Stone in the bladder is there more frequent than in other places. — Those who have constantly drank distilled water, by way of prevention, have nevertheless been subject to Gravel.

Bartholine informs us that when *Olaus Borrichius* visited the dreadful cavern of *Okey hole*, he was amazed at the pendulous *striae* on its roof which had been formed by the constant dripping of clear, insipid water; and enquired of the inhabitants, who constantly drank it, whether they were subject to Stone and Gravel: He was answered, that they were *much less afflicted with Stone than any other people in England; and that this water not only effectually cured the strangury, but powerfully expelled both Stone and Gravel*; a circumstance which is confirmed in the first volume of *Boerhaave's Chemistry*.

THIS opinion is also supported by a comparative view of the number of patients cut for the stone in the several county-hospitals of England, according to reports made by the different physicians, and surgeons of those hospitals, with a view to discover such disposition to Gravel and Stone as might proceed from the qualities of water, situation, and manner of living peculiar to each; but it was concluded from these reports; that although it appeared the stone prevailed more in some places than others; it nevertheless is confessed, that

this difference cannot be satisfactorily accounted for, either from the qualities of water, the nature of food, or of local situation; and therefore is to be referred to other causes.

THAT the *nephritic cause* often proceeds from an *hereditary disposition*, and is inherent in the constitution, I think, there can be little doubt; when we consider, that similitude of bodily frame, complexion, and natural temperament are all derived from the same source.

IN farther confirmation of the preceding facts, I shall transcribe the following remark, from *Dr. Dobson's Commentary on fixed Air*.

“ It is to be observed that the *pump-waters of Manchester are remarkably hard*; and yet this town has sent only twelve Stone patients to the Hospital, during a course of twenty-six years; while Sheffield, which Mr. *Wcoffendall* informs me, is wholly supplied with *very soft water* from an open reservoir at some distance from the town, has, in six years, sent eight patients to the Manchester Hospital.”

ALTHOUGH

ALTHOUGH stony particles attach themselves to all indissoluble, solid substances; there is not any body to which they so strongly adhere as to stone itself, or those of their own nature; as therefore it is allowed that a stone in the kidneys, however small, by remaining too long there, may form a *nucleus* by attracting the stony particles of urine; upon the same principle, and by parity of reasoning, the hard, *sparry water* of Knareborough and that of the Caroline Spa, &c. may become beneficial to those affected with *Gravel*; for, those waters being strongly impregnated with calcarious earth or sparry matter, with which, as appears by their transparency, they intimately combine; it may be conceived, that such waters, in passing copiously through the kidneys, will more powerfully attract the stony particles of urine, with which they have affinity, then such particles attract each other; and, that in union with them, and by their gentle stimulus upon the kidneys, they will thus solicit their own discharge: This supposition founded on the universal law of attraction, is farther illustrated by the process of *petrification* in porous bodies, through

which petrifying water is freely transmitted, while its stony particles, by the power of attraction in such bodies, are arrested and left behind.

BUT whether this be their manner of acting, is not material, nor shall I contend it is precisely such; the main question will be, whether *sparry waters* (as the preceding circumstances tend to prove) are, in reality, productive of good effects or not? and as this is a circumstance of importance to those afflicted with Gravel and Stone, and an opinion somewhat new and extraordinary; it deserves to be examined with attention; but chiefly, by repeated, practical facts and accurate, unbiassed observation, to be confirmed or controverted.

WE have so far examined the state and condition of the human body; the origin and nature of Gravel, and component parts of the Stone, with their several symptoms, according to the theory of *nephritic diseases*, adopted by Authors of the first eminence; but, as it must be confessed, notwithstanding great improvements in medical science, that our knowledge is still imperfect, re-
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specting a safe and effectual solvent for the Stone ; as appears by the great number who unfortunately are obliged to submit to the operation of cutting ; it should be the conduct of every unprejudiced mind, to regard with attention and candour, all such hints, and new observations communicated by men of credit and science, as bid fair to be useful.

ALMOST infinite is the number of authors on the subject of *Gravel and Stone* ; but, with an intelligent and discerning Reader, it must considerably weaken the authority of the whole, to observe ; that there is scarcely a single point of doctrine, whether new or old, in which they uniformly agree ; so that, what is advanced by one, as beneficial and perfectly right ; is controverted or condemned by another, as pernicious and essentially wrong.

ALL medical science at last centers in the cure of diseases ; and that is the most useful part, which enables us to effect it. To ascertain the origin of a Stone in the bladder would therefore be a desirable event which might perhaps lead more directly

to its prevention, or cure : I shall therefore take the liberty of mentioning the following particulars relative to the subject in question.

Dr. Austin, in his ingenious Treatise on the Stone in the bladder, advances a new Theory to account for its formation : Having analysed the human *calculus*, and finding it contained a very inconsiderable quantity of earthy matter, its substance being almost totally evaporated by gentle heat ; he concluded that the stone is chiefly composed of *animal mucus*, preternaturally secreted by the glands of the diseased bladder and urinary passage ; and not of calcarious earth contained in the urine, and generated in the kidneys according to the prevailing opinion.

IN support of this doctrine, and to shew that the earthy matter of urine is not necessary to form a Stone ; *Dr. Austin* adduces cases of Stones being formed in various parts of the body, which have no communication with urine or the urinary passages ; which, indeed, is no slender evidence in favour of this new Theory : If it be just, his deductions from it, regarding the method of cure in
calculous

calculous diseases, may be so likewise; *viz.* the disease not residing in urine, or being seated in the kidneys; but in the bladder and urinary passages; such medicines should be directed in its cure as chiefly act upon those diseased parts. The Author proceeds to remark, that the sudden ease, sometimes procured to the patient by drinking lime-water, and other medicines, could not have been brought about by their action on the Stone itself, but by their effects on the coats of the bladder. I shall conclude his observations in his own words.

“ I do not presume to infer from any observations which have been made, that the urine may not often contribute something to the composition of the Stone: I only contend, that it is not the principal source of the Stone in most cases, and in some, that it does not assist at all in its formation. I conceive that the proximate cause of the disease, or Stone, does not exist in the uriniferous vessels of the kidneys, or in the fluid secreted from them, but in the coats and glands of the several cavities through which the urine passes.”

WHAT

WHAT renders the preceding opinion probable is a fact in comparative physiology, not, I think, mentioned by the Author; which may be observed in the production of egg-shell, in oviparous animals; for, the *ovum*, during its residence in the *ovaria*, is imperfect, and consists of yolk only, invested with a delicate membrane; but, being detached thence, in its progress through the ovi-duct which is beset with mucous glands; by an animal process peculiar to this part, the egg not only acquires that fine gelatinous fluid, we call the *white*, but also becomes possessed of a hard, calcareous shell which reduced to powder and mixed with any fluid, exactly resembles the chalky matter voided by *nephritic subjects*.

THIS circumstance is mentioned by the celebrated *Harvey* in his *Exercitationes* on the generation of animals; where, in speaking of the *Basse Island* in the north of Scotland, frequented by various birds and water-fowl, he thus expresses himself. “ That which thus discoloureth the Island, is a white crust, which is friable, and of the very same consistence, complexion, and nature with the egg-shell. The bottom of the Island

stand which the tide washeth, every day, retaining still its natural colour, sheweth, that this *fucus* or sophisticated whiteness, proceeds from the liquid excrements of the birds, and by which, as it were with an egg-shell, white, hard, and friable, the walls are crufted and disguised. It is a thicker part of their urine, which we call *sediment* or *hypostasis*, in ours. I have found as much of this slimy cement in the repository of a dead *ostrich* as would fill one's hand: So in a *land-tortoise*, and several other four-footed creatures that are ovi-parous, this white, plastering stuff doth abound. Thus, chamber-pots, and places where people urine much, use to be over-cast with a yellow cruft, from the concrease of that substance which createth stones in the kidneys and bladder; and other parts of the body."

WHETHER therefore in a natural or diseased state of the body; there is, probably, always a considerable quantity of calcarious earth, which may pass off by the urinary glands, together with their fluids; but where, by a *calcarious*, or *gouty diathesis*, it too much abounds and is long retained

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in the constitution; it occasions *nephritic*, and *gouty symptoms*; for, it appears from the observations of *Van Swieten*, *De Haen* and other practical writers of the best authority, that *gouty and calculous symptoms not only concur, but frequently succeed, and alternately relieve each other.*

SINCE then *earthy matter* may be found in the bodies of all animals, even in a healthy or natural state; it is highly probable that their elementary particles, in a certain degree, are essential to the well-being of the constitution, and only offend or become destructive to it, when they too much abound, and exceed their natural quantity: *The bones themselves were once in a fluid state, and originally formed of such earthy matter.*

BE this as it may; if the mucous glands of the diseased bladder and urinary passage have the power to secrete even a small portion of calcareous earth with an abundant quantity of their mucus which together may concrete into a Stone, as suggested by the new Theory; there can be doubt, but the kidneys may also participate of the
same

same morbid disposition; and that the frequent or perhaps the principal cause of the Stone originates from the urine which like the Stone itself, plentifully abounds with a volatile, and fixed salt, oil, mucus, and a large portion of fixed air; but chiefly, because, the *urinary tubes of the kidneys, have sometimes been found full of sand or gravelly particles; and the pelvis of the kidney itself loaded with fabulous matter.*

RESPECTING the nature and constituent parts of the Stone, hardly any two authors agree; and as we can scarcely doubt their veracity, it may be concluded they described appearances as they found them, and that human *calculi* in different bodies are essentially different in their principles. By the experiments of *Hoffman*, on renal stones, it appears, they neither contain fixed, alkaline salt, nor calcarious earth; but only alkaline volatile salt (perhaps something similar to the *sublimate of scheele*) such as that obtained from hart's-horn: Neither did the stone contain oil, or sulphureous principles. On some small stones *Hoffman* poured spirits of vitriol, and upon others spirit of salt, neither of which dissolved them;

but

but they soon dissolved in spirit of nitre, and also in *aqua fortis*: But we are told, that these experiments were not made by *Hoffman* himself; and therefore more attention is due to *Dr. Hales*, and *Slare*, authors of the best authority and who relate what they saw with their own eyes. By the accurate experiments of the first; oil was obtained from a stone of the bladder, but more from biliary concretions: He remarks that, in both, above *one half of their bulk consists of inelastic, fixed air*; so that when it was set at liberty, and rarefied by heat, it filled a space compared to the magnitude of the stone from which it was detached, as 645 to 1: *Dr. Hales* therefore supposed, that, if by any means, this fixed air could be disengaged from the stone in the bladder; it would not only lose half its bulk, but, by its escape, the stone would be rendered so *porous*, and so much diminished in cohesion, as to fall in pieces like sand; and, in such state, be dissolved by the constant flux of urine: He also farther observes, that this *fixed air*, when extricated and freed from its union with the stone, becomes elastic like common air. From the preceding circumstances and his own experiments,

experiments, the celebrated *Stahl* concludes, that, whatever has the power to extricate and disengage fixed air from a stone in the bladder, and restore it to an elastic state, would prove a *real solvent for the human calculus*. From the tartar of rhenish wine, *Hales* also obtained a quantity of air, in weight amounting to a *third part of the tartar*; and from its near resemblance to the human calculus, he calls the last *animal tartar*. A biliary stone, in seven days, was dissolved in *lixivium of tartar*, which would not dissolve stones of the kidneys and bladder, although they were soluble in spirit of nitre.

Dr. Mead mentions the different degrees of concretion in fabulous matter, from a clear, limpid water, to a milky liquor which shot into slender branching crystals, and coalescing became a hard, friable substance, in the kidneys of a boy five years old, who died in *St. Thomas's Hospital*. He therefore supposes that tartarous salts sticking in the tubes of the kidneys are the principles of Gravel, and proposes lixivial salts as a remedy to prevent them from shooting into crystals; and next, oily medicines to hinder them from con-

creting into a stone. — If this is the cause of Gravel and Stone; the use of crude mercury minutely divided, would probably also become an efficacious medicine, by pervading the urinary tubes, and promoting the secretion of urine. Emulsions of castor-oil, with lixivium of tartar will also be proper, as I shall hereafter have occasion to observe.

By *Dr. Slare's* analysis of the calculus, it appears that oil enters into its composition; and *Lister* perceiving that *iron* might be extracted by the loadstone from the ashes of a human calculus calcined by fire, concluded, that ferruginous particles might contribute to its formation.

It has been experimentally and satisfactorily proved by *Dr. Ambrose Dawson*, that the human calculus, voided from the urinary bladder, differs in its texture, and is dissimilar in the nature and quality of its parts, in different bodies; and even in the same individual, at different periods of time; inasmuch that those which may be dissolved by an alkaline menstruum (soap-lee, and lime-water) will not be affected by muriatic

riatic acid or spirit of sea-salt; and *vice versa*; consequently, from this practical fact, it is plain, there can be *no universal solvent for the stone*. Upon the whole, it may be concluded, that the human calculus generally contains different proportions of *volatile, urinous salt, oil, mucus, and earth*, with a very large portion of *fixed air* which constitutes one half of its bulk.

THE intent of this *Section*, by taking a view of the different *Lithontriptics*, is therefore to shew, that, like all other things, they are limited in their effects, and good or bad, according to their proper or improper use; and likewise, to inform the Reader, what he may reasonably expect from their different qualities, under different symptoms, and circumstances of the disease, as well as to fix his attention on such as have been experimentally found most safe and beneficial.

HAVING thus examined the state and condition of the solids and fluids, it is necessary to inquire, what medicinal substances are endowed with the property of preventing the separation of gravelly matter from urine; dissolving it when formed, or

expelling it from the body when it is suspended in urine; for, those are most likely to be effectual in *preventing Gravel* which is the origin of a Stone; especially, as it has already been remarked, that in proportion to the *sudden separation and concretion of stony particles in fresh-made urine, the patient is more or less disposed to Gravel*; and, as some stones are with difficulty dissolved, and others cannot be dissolved at all; we should, if possible, endeavour to prevent their formation; or find out the most effectual method of expelling them before they become too large to pass. The danger being thus obvious to the patient, if he is attentive to his own future good, he will endeavour to avoid it.

It will now be proper to enumerate the several leading symptoms of Gravel, and Stone in the *kidneys, the ureters, and urinary bladder*; and to shew how they resemble others for which they may be mistaken. The first symptoms of Gravel are generally so slight that they are commonly disregarded or imputed to other causes: But, when once they are ascertained by its appearance
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in the urine, or in any other manner which may render the patient's disorder self-evident, he will then do well to remember, that the same calculous disposition remains in his constitution after the symptoms are over, and will grow upon him with age, intemperance, or other concurring causes ; and as fabulous matter is known to concreate ; *this disease which began with Gravel in the kidneys, if neglected, may end with a Stone in the bladder ;* and, if the increase is rapid ; without its speedy expulsion, the patient will probably be obliged to submit to *lithotomy*, which, as already remarked, is always uncertain, and often unfavorable in its event.

THUS, we are informed, that a nobleman received into his palace twenty-two poor persons who like himself were afflicted with a Stone in the bladder, and whom he maintained, on purpose to undergo *lithotomy*, by the celebrated *Frier James* who performed the operation upon the whole, and cured them every one : *This nobleman then submitted to the operation, by the same hand, but unfortunately died !*

WHEN a *nucleus* is found in the centre of a Stone that is either voided, or extracted, there is reason to hope the disease is at an end; but otherwise, the same disposition which prevails in the general habit may generate more: A *nucleus* may indeed arise from a small renal calculus, but it may also proceed from an extraneous body accidentally admitted into the bladder; where the cause being evident, affords hopes, that there is no spontaneous or permanent *nephritic tendency* in the constitution.

WHEN gravelly matter is lodged in the kidneys; and the nephritic symptoms prevail in a considerable degree; the patient feels pungent, pricking pains in the back and loins, with a sense of weight, attended with *nausea and vomiting*, and sometimes, especially after riding or violent exercise, voids bloody urine, with sharp, red sand, or chalky sediment mixed with mucus.

WHEN the urine is fresh, and quickly voided; the blood in it may be distinguished by its colour, which otherwise becomes of a dusky brown resembling strong coffee: Bloody urine, therefore,
after

after violent agitation of body, and where a sense of weight and pain in the loins with vomiting preceded, are almost certain signs of sharp Gravel or Stones in the kidneys; although it may also sometimes proceed from a preternatural dilatation of the urinary tubes so as to transmit blood instead of urine; but if it succeeds a suppression of bleeding piles, or other accustomed discharge of blood, is unattended with pain or fever, and not so copious or frequent as to impair the patient's strength, it is not dangerous, but critical, and ought not then to be suppressed.

By *nausea* and *vomiting*, nephritic symptoms are to be distinguished from those of the *colic*, and also from *lumbago* or rheumatism in the loins, where the patient cannot, without pain, stand upright; but where sickness and vomiting are generally absent: Sometimes the *vomiting is bilious*, and therefore, this complaint has been mistaken for one of the bilious kind; but, as it plainly arises from irritation and nervous sympathy; bleeding, a solution of gum arabic, and *opiates* will be most proper to abate pain and inflammation, after which the *bilious symptoms will cease*.

IN this particular case ; *vomits*, which would agitate the body, and increase inflammation, are improper, although they have sometimes been inadvertently directed, on account of the bile and sickness at stomach, which here are only symptomatic affections.

A large, smooth Stone may long remain in the kidneys or bladder, without pain ; while those which are small but angular, by their sharpness and irritation may excite the most excruciating torture, which will always be most violent and intolerable when they change their place and are moving from the kidneys through the ureters into the bladder ; a singular instance of which happened many years ago in the daughter of *Sir Hugh Middleton*, who by the violent exercise of riding on horseback, altered the position of the Stone which produced a mortal suppression of urine : An abscess, with purulent matter was formed in the left kidney, and a brown Stone which was *fistulous* or hollow like a pipe, was found at the *bottom of the left ureter*, where that tube, as already described, passes obliquely
into

into the bladder, and where renal stones are most liable to stick and occasion *obstruction of urine*; until the weight of that fluid in the ureter forces it through the narrow passage into the cavity of the bladder, by which the patient finds immediate relief from pain.

SHARP Stones in their progress from the kidneys to the bladder, not only occasion the symptoms already mentioned, but excessive pain at the posterior part of the bladder tending to the *rectum*, producing *tenesmus*, with frequent inclination and difficulty of passing urine, violent stricture across the lower part of the belly, with numbness on the inside of the legs and thighs, and their loss of motion.

IN this painful state of the disease, where, from the vast degree of irritation, fever and inflammation of the affected parts are to be feared; forcing or *diuretic medicines* would aggravate the symptoms, and therefore ought never to be given; although this necessary caution is often disregarded, to the great detriment of the patient's safety.

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THOSE remedies which relax the solids, dilute the blood, and diminish pain and febrile heat, will most relieve the patient; therefore, *bleeding*, the *warm bath*, *emollient clysters*, *opiates*, and *plentiful dilution*, with *mucilaginous*, *oily emulsions* which mollify, and as it were constantly *bathe the kidneys*, will be proper and necessary.

IN nephritic cases, therefore, half a pint of shell lime-water, with a fourth part of milk, may be drank three or four times a day, as the stomach will bear; or two drams of almond, or castile soap dissolved in half a pint of thin chocolate may be taken, at two doses by proper intervals; for, repeated experience has shewn, that both soap and lime-water, may be largely taken, without injury to health, or that putrefaction of the blood and juices apprehended from their use; but should the last be nauseated by the stomach, or when the appetite fails; *alkaline, mephitic water* has been observed in such cases, to relieve both. The almond emulsion, with forty drops of lixivium of tartar, sweetened with manna, in the quantity of four ounces, may be taken twice or thrice a day, and is not only an elegant, but an efficacious medicine in
nephritic

nephritic cases. Half a dram of alkaline salt dissolved in three ounces of water sweetened with honey, may be swallowed; and immediately after it, half an ounce of fresh lemon-juice, diluted with the same quantity of water; this mixture will ferment in the stomach, and has been recommended as a powerful dissolvent.

Birch sap has also been recommended in *nephritic cases*; and *maple-juice*, of which, as well as the former, sugar may be made, partaking of the same quality, may perhaps be more, or equally beneficial: Those remedies however should be regularly pursued for several months, otherwise no lasting effect can be expected from them. But indeed, the truth is, they are much better calculated to prevent the formation of Gravel in the kidneys, than to dissolve it when concreted into a stone in the bladder.

Seltzer and *Carlsbad waters* are much celebrated by *Hoffman*, for their extraordinary efficacy in all diseases of the bladder and urinary passages, whether proceeding from calculous matter or other causes: Both these waters, according to his experiments

periments contain a large quantity of fossil alkali combined with fixed air ; and probably produce their good effects, in the same manner, as the *mephitic, alkaline water in which those qualities predominate ; and, by the experiments of Dr. Falconer, act in a manner more mild, and efficacious, than that of water simply impregnated with fixed air* : He supposes that the alkaline, mephitic water acts on the gravelly particles, while the latter only dissolves the mucus which glues them together.

IN other respects, the method of cure, with little variation, may here be pursued, as that directed for relief in passing gall-stones, and particularly mentioned in the Section *on diseases of the Liver*, at page 275, to which the Reader is referred ; but it may be necessary to add ; that *Emetics*, if they are given at all, should be directed with more caution than in bilious cases proceeding from gall-stones ; and that, after the warm bath, opiate, emollient clysters, and fomentations to the loins ; *cupping-glasses*, with, or without scarification, have been applied, to facilitate the descent of stones through the ureters, with great benefit,

benefit, both by the antients and moderns ; beginning to place them first above the kidneys, and afterwards proceeding with them downwards, in the direction of the pain towards the groin and neck of the bladder.

It has been remarked, that stones in the bladder, and kidneys have been found at a very early period of life, and the following case is an instance of it.

SEVERAL years ago, I was desired to visit a child about five years old, the son of a tradesman in *Bridge-street, Westminster*, who had a stone in the bladder: As he was always complaining of his belly, he was supposed to have worms ; but by the frequent endeavour to make water, which was sometimes obstructed, the irritation at the extremity of the urethra, and other symptoms ; I suspected a stone, and desired Mr. *Bromfield* might be called in, who on passing the catheter plainly perceived it: At that tender age, he underwent the operation of *Lithotomy*; which being performed by that dexterous operator, and judicious Surgeon ; a stone, about the size of a small pigeon's egg, was extracted, and he soon perfectly recovered.

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THE signs of a Stone in the bladder are very equivocal, and many of them so common to other diseases, as to render them uncertain: Indurated tumours at the neck of the bladder, for instance, are attended with symptoms like those of a Stone; also an *ulcer*, or scirrhus enlargement of the bladder itself; and therefore, to distinguish them more justly, it will be necessary to attend to the several symptoms and circumstances which either precede or follow the evacuation of urine; namely, to remark whether the patient discovered the signs already mentioned of a disposition in his urine to form *calculi*, or whether he was descended from calculous parents; whether the symptoms of a renal stone preceded, and the violence of pain suddenly ceased; lastly, whether the symptoms are like those peculiar to a Stone in the bladder; particularly, that of excessive pain which comes on when the patient has just done making water, in voiding the last drops, and is owing to the contraction of the bladder on the sharp, scabrous surface of the Stone.

It

It should also be remarked, that this kind of pain is more frequent when the Stone is too large to pass, than when it is small ; for then, it is apt to enter the neck of the bladder with the first gush of water, and as it were by corking up the passage, is more likely to produce an obstruction or total suppression of urine than a large one : On the other hand, when the pain and difficulty of passing urine is permanent, or continues alike during the whole time of its evacuation, and also afterwards ; it is then highly probable those symptoms arise from a diseased state of the bladder and urinary passages ; or from some other cause inducing strangury, which may proceed from an *ulcer*, a translocation of morbid humours, or sharp scorbutic salts to the neck of the bladder ; and also from the imprudent exhibition of *spanish flies*, or *turpentine*, and from the use of tart, old beer, or other austere fluids.

CONSIDERING the rapid growth of a renal Stone in the bladder, after its descent from the kidneys ; its sudden expulsion is a thing of the highest moment to the patient's safety ; but unfortunately, he is lulled into a fatal security,
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by his present relief from pain, and often neglects the means of effecting it, till it becomes too large to pass.

THE warm bath, emollient clysters, and opiates where there is pain, with all such applications as relax the urinary passage are the most proper for dislodging it: It will also be necessary to dilute plentifully, so as largely to fill the bladder with fluids of the oily, soft, mucilaginous kind; such as decoction of marsh-mallow, linseed-tea, or almond-emulsion; and after retaining the urine so long as to excite a powerful endeavour to void it; to assist the first sudden gush of water, by a powerful effort, towards the expulsion of the Stone; by which means, it has happily been effected.

STONES after passing the neck of the bladder will sometimes stick in the *urethra*: An instance of this kind occurred to me in a pastry-cook in *St. Martin's Lane*, which with some difficulty was extracted. In such cases we are informed by *Prosper Alpinus*, that the Egyptians succeeded by *inflating the urethra*, from which, the urinary canal was so dilated and enlarged as to allow passage for the stone.

Pareira

Pareira Brava, American wild Vine, or *raiz de nossa Senhora*, was much recommended, and highly extolled in *Portugal*, several years ago, for its efficacy in Gravel and Stone, the jaundice, *obstruction of urine*, and all diseases of the urinary passages. *Geoffroy* gave it with such success, that his patient was soon relieved of a *suppression of urine*; and in other cases observed large quantities of gravel, and even small stones voided by its use: He likewise asserts the great benefit of this medicine in ulcers of the kidneys and bladder, where the urine which had been *purulent* and voided with great pain, afterwards became clear like healthy urine and passed with ease; in the same manner as after the use of *Uva Ursi*: Those good effects he ascribes to its attenuating quality, in dissolving that mucus which unites the gravelly particles, and not to its power of dissolving the stone.

THOUGH I doubt not the efficacy of this medicine, yet as *mucus* has often been mistaken for

A a matter;

matter ; *Geoffroy* might possibly fall into an error in supposing the *urine purulent* ; it will therefore here be proper to specify their real difference.

THE late ingenious Mr. *Charles Darwin*, in his Dissertation which gained the prize-medal given by the *Æsculapian Society* of *Edinburgh*, whose premature death, all lovers of science deservedly lament, has experimentally pointed out the most certain criterion or unerring test by which to distinguish the difference between *matter* and *mucus*, in the following manner.

Matter and *mucus*, in different proportions, are both soluble in vitriolic acid : The addition of water to either of these solutions, decomposes them ; *mucus* generally swims on the mixture, whereas *pus* or *matter* falls to the bottom. *Alkaline lixivium* generally, though with difficulty, dissolves *matter* and *mucus* in different proportions : Water added to the solution precipitates *matter*, but does not precipitate *mucus*, &c.

Pereira

Pareira Brava is an article of the *materia medica* in the *Lusitanic Dispensatory*, and when I was at *Lisbon* was so much in vogue among the portugueze nobility and others, as to make a principal ingredient, in most of their *diuretic ptisans*: The root was also given in powder from twelve grains to half a dram; and in decoction, from two to three drams or more; but I was informed that it was necessary to use caution in not directing an overdose, lest it should excite heat and inflammation of the kidneys. This root is of the *convolvulus* kind, about the thickness of the finger, dark-coloured and wrinkled on its surface, and internally of a yellowish brown: By a clean-cut, transverse section of the root, a number of concentric circles appear intersected with *radij*, from the centre to the circumference, which give it a very beautiful and uncommon appearance, as if it was the effect of art; between those several divisions, as it were in little cells, lies a kind of concreted substance, of a bitterish sweet taste, not ungrateful, and which, in its recent state, seems to have been a kind of gluten or rich sap: Being then a new medicine, and much talked of

at *Lisbon*; I brought with me a considerable quantity of it when I returned to *London*, and presented specimens to several medical gentlemen, with an account of its effects; but it was regarded in the same manner as when I mentioned the use of *Crystals of Tartar*, which I had seen given with extraordinary good effects in the cure of Dropsy, at the public Hospital in *Florence*: But now, strange to say, it would be an unpardonable omission, to suffer a patient to die of dropsy, without exhibition of that medicine: Such is the run, or rather the epidemic rage of fashion in physic, as in foppery; that nothing but the exalted genius of *Peter Pindar* can do justice to the subject!

Uva Ursi, a species of *arbutus*, common in *Sweden*, and so astringent as to be used in tanning leather, is another medicine of reputed efficacy in complaints of the Gravel and Stone, and in ulcerous diseases of the urinary passages. The celebrated *Linnaeus*, as well as *De Haen*, mentions the extraordinary efficacy of this plant in such cases. Its dried leaves, in powder, were given in the quantity of half a dram, for ten or twelve days.

days together, and with such speedy relief to the patients, that they thought themselves cured; although it appeared, on passing the catheter, the stone in the bladder remained as before. By its use, the urine of such as took it, instead of being glutinous, foetid, and calcareous, became more clear and inodorous, like healthy urine.

THE relief procured by this medicine was often lasting, and where the symptoms returned, a *repetition* of it was attended with the same good effects as before; which were such indubitable proofs of its singular efficacy, that it may be proper to inquire in what manner it acted on the constitution.

It has been remarked, in speaking of bitter astringents, that they possess in some degree, a *sedative power*; whether this may be the property of the *Uva Ursi* or not, remains to be determined; but being a strong astringent, it would rather increase the cohesion of that mucus which forms a great part of the stone, than tend to separate or disjoin its parts, and therefore does not seem to act upon the stone itself, but on the parts

which are irritated and affected by it: Like the peruvian bark, by giving a greater degree of strength and firmness to the general system, and *diminishing the sensibility and irritability of the bladder and its mucous glands, it most probably produces its effects* and may afford hopes of the like benefit, from a trial of other vegetable substances, of a similar nature.

Fixed air constitutes a part, and almost universally enters into the composition of all bodies; and whether considered as a philosophic, or medical subject, has been found to possess such powerful and extraordinary properties, that it has exercised the ingenuity, and employed the leisure of some of the first philosophers, and physicians in Europe. It constitutes the volatile principle in mineral waters, and particularly abounds in those of the *Caroline Spa*: From this principle, as well as its *sparry quality*, the water possesses the power of relieving those affected with *Gravel and Stone*, which have been found to dissolve in it; and likewise in the urine of those who drank it copiously, as observed by *Springfield*, who wrote on that subject several years ago,

THE *fixed air* which most of the German Spa waters contain, is *acidulous*, being that volatile principle which gives them pungency and agreeable taste, and in which their virtues chiefly reside. By the acid of these waters, alkaline bodies may be saturated and neutralized, like lemon-juice with salt of tartar.

By means of acidulous gas, iron is dissolved and suspended in most of the chalybeate waters, which falls to the bottom of the bottle, in form of a *yellowish ochre*, whenever the gas evaporates; but if this subtle spirit or fixed air as it is called, be restored to the water by art, the ochre is again soon dissolved, and the water becomes clear. Hence it may be asked, whether *alkaline, mephitic water*, largely admitted into the animal body, may not act on the calcarious matter of urine in the same manner; and by keeping it in a state of perfect solution, thus produce its good effect, by conveying such matter out of the body?

THE Honorable Mr. *Cavendish* has clearly proved, that calcarious earth is rendered soluble in water impregnated with more than its natural quantity of *fixed air*: This circumstance suggested an idea that the human calculus, which in part, contains such earthy matter, might perhaps be dissolved by *mephitic water* or that strongly impregnated with fixed air, which was afterwards verified; and particularly, as it had been observed by *Dr. Hales*, that small human *calculi* were diminished by means of such air in fermenting mixtures; also because this conjecture was confirmed by a similar solvent power in the *Caroline waters* possessed of such fixed air, and in the urine of those who copiously drank them.

FROM the ample and repeated experiments of the late *Dr. Dobson*, in his *Commentary on fixed air*, and those of the accurate and ingenious *Dr. Falconer* on the same subject, in his Appendix to that valuable work, the following conclusions may be drawn; viz. that in all diseases of the bladder and urinary passages, from gravel, stone, ulceration, or other morbid affections of those parts, attended with pain and fever; the discharge

charge of mucus, and even of matter; the good effects of *fixed air* have been manifest and indubitable; and so completely ascertained a safe, and in many cases an efficacious remedy, as to render it worthy of attention, and of still farther trial; for, although it may not effect a solution of the calculus, it has nevertheless, often been observed to remove the painful symptoms; being also grateful to the taste, and highly refreshing to the stomach of the languid patient. It therefore, only now remains to mention, *the most simple manner of preparing it*; the quantity in which it should be administered, and the regimen necessary during its use.

THE most simple, and expeditious method of preparing *mephitic water* is as follows: Let any quantity of pure water be suspended within a large vessel half full of fermenting liquor, and let the water be frequently agitated with a churn-stick, so as constantly to expose its surface to the vapour proceeding from the liquor. When the water is thus strongly impregnated, it should
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be removed and quickly put into bottles or stone vessels *closely corked*; and placed, with the cork downward, in a cold cellar.

ANOTHER method of impregnating water with fixed air, by a glass apparatus contrived and recommended by *Dr. Nootb*, is so well known, that it will be unnecessary to describe it; but the merit of the original invention is due to *Dr. Priestley*.

THE *alkaline, mephitic water*, for the reasons already given, being preferable to simple water impregnated with fixed air detached from chalk and water with oil of vitriol, may be expeditiously prepared in the following manner, only by substituting *a solution of salt of tartar, instead of common water*: To five quarts of pure water, add one ounce and a half of salt of tartar; and after it is perfectly dissolved, let the water be poured off from the dregs, through a double flannel bag, for the purpose of being impregnated with fixed air, either in the manner already mentioned, by being exposed to the subtle gas of fermenting liquor, or by the glass apparatus recommended

commended by *Dr. Nootb.* The water will be more or less impregnated with fixed air, in proportion to the time the process continues; two days being generally required for that purpose when prepared by the glass machine; but, if exposed to fermenting vapour, a few hours are sufficient.

HALF a pint of this water taken three or four times a day has been found highly beneficial in calculous complaints, and in many diseases of the stomach, and bowels. For the benefit which may be derived from the use of this medicine, the public is obliged to *Benjamin Colborne, Esq.* of *Bath*, who took it for a considerable time with extraordinary good effects in a calculous disorder with which he had been long, and severely afflicted. In a word, this water has been experimentally found to possess a considerable degree of solvent power upon the human calculus; it also *resists putrefaction*, and being grateful to the stomach, and mild in its operation, may always be taken with safety.

IN gravelly complaints, the patient may take every day, by intervals, three half-pints, or more, of this *mephitic water* sweetened with honey, for common drink : Mild cask-ale, or spruce-beer may also be drank occasionally, especially at meals. Seltzer water with rhenish wine, in a state of fermentation may also be used at pleasure.

BUT as some *calculi* are with difficulty acted upon by mephitic water, especially those which are chiefly composed of mucus from the bladder; previous to the use of this medicated water, it may be proper to try whether the gravelly matter voided by the patient will dissolve in it ; if not ; another medicine better appropriated to its nature may be used ; namely, a *lixivium of tartar* in whey, or even the caustic alkali or capital soap-lee may be given with caution, in a solution of gum arabic, or veal-broth.

THE celebrated *Baron Van Swieten*, greatly to his honour, in speaking of the various remedies for the Stone, takes a very candid and circumstantial view of Mrs. *Stephens's* Medicine ; like one
whose

whose only aim was truth, and the public good; and not in the supercilious manner of *Dr. Mead* who with more pride than propriety calls it an *old woman's remedy*, and reflects on the wisdom of legislature for paying so liberally in the purchase of it: *Peruvian bark* and some of the most valuable medicines known, we are told were discovered by chance, or experience of the vulgar, after accurate researches had been made for them in vain: Had *Dr. Mead* been among the american savages, and seen them cure the *hydrophobia*, that dreadful symptom from the bite of a *mad dog*, by a medicine unknown to him; under those alarming circumstances, I believe, he would have stooped from his dignity, and have been glad to avail himself of its benefit.

ALTHOUGH the expectation from *Stephens's* Solvent might be too great; its good effect as observed by *Van Swieten*, in many cases, has been proved; and it was followed by this public advantage, that, thence, the use of *lime-water* seems to have been introduced, and many experiments made

made with it, and other valuable medicines of a similar nature, which otherwise would probably never have been known.

Mrs. Stephens, by birth a gentlewoman, we are told, first began to administer her medicine about the year 1720, and after many alterations and improvements, to render it more simple and efficacious, at last confined herself to the following form : She gave *egg-shells calcined to whiteness, in the quantity of two scruples, or even one dram*, thrice a day, in a glass of white wine or any convenient fluid ; drinking after each dose, from *half an ounce, to nearly one ounce of castile soap* dissolved in five or six ounces of water sweetened with honey ; Thus administered the medicine kept the bowels gently laxative ; but here, as in other cases, the dose may be increased or diminished according to circumstances, and as the stomach will bear ; but it is proper to remark, that where the patient is very infirm, and the bladder and urinary passages tender, the *shell-lime may be rendered milder by a less degree of calcination.*

By the use of these medicines it was proved, that gravel was expelled from the kidneys, and even stones in the bladder sometimes dissolved; but, as it was observed, that the urine not only acquired a solvent power, but was thereby also rendered alkalious and putrid; it was with reason apprehended, they might dissolve the blood and induce a putrid tendency in the general habit: Future experience however removed this apprehension, and proved that, in general, neither their quantity nor continued use, injured the constitution. The urine of those who take these medicines does indeed become alkaline and effervesces with acids; but *Van Swieten* observes it does not hence follow that the blood and juices will be affected in the same manner; for, urine contains much more salts than blood; and therefore, when lime-water is added to it, exhales an offensive vapour.

Dr. Huxam acknowledged the virtues of these medicines, and *Morand* attests that many had taken them for a long time without injury; nay some with such alleviation of their complaints, that they thought themselves cured: He however observes,

serves, that in ulceration of the bladder or urinary passages, those medicines are pernicious. The observations of *Hartley* also confirm the action of these remedies on the Stone, who has given figures of Stones which had been eroded and rendered brittle from their use.

BUT as these medicines contain a large quantity of calcarious matter ; it has been supposed, that a great part of that voided with the urine, during their use, was not the calcarious matter of a stone in the bladder, but of the lime taken to dissolve it ; for, it appears from the accurate experiments of the late ingenious Dr. *Macbride*, that lime-water, even in its most limpid state, contains calcarious earth which instantly separates from it, and subsides when the fixed air is restored to it, of which it had been deprived by calcination.

HENCE it is concluded, that, in the same manner, when these medicines absorb, or release the fixed air contained in the human calculus, it then becomes porous, brittle, and in a state of solution ; and therefore, that the solvent power of *lime* or *lime-water* when taken with milk, or other fluids

fluids replete with fixed air, are considerably weakened in their effects, by their combination with the fixed air of such additional fluids; and even that *soap itself is not necessary towards their solvent power*; as Mrs. Stephens's Medicine, at first, consisted of *calcined egg-shell only*, and without the addition of soap afterwards added to keep the bowels open, was attended with powerful effects as a solvent.

IN the case of the late Rev. Dr. Newcomb, who daily drank two quarts of *lime-water without soap*; it was proved that his urine possessed the power of dissolving human calculi immersed in it; it may therefore be reasonably presumed, that urine thus strongly impregnated, may even have the happy effect of dissolving some kinds of stones in the bladder; especially those which contain a considerable portion of volatile matter called the *sublimate of scheele*, and are not of a flinty nature.

As far as soap possesses a solvent power, it entirely depends upon the *alkaline salt* in its composition, rendered more acrid by the addition of

quick lime, used by the soap-makers, and by them called *capital lees*, which, according to the experiments made by *Dr. Hales*, entirely dissolved the human calculus; but this like *spirit of nitre* which has the same effect on stones taken from the bladder; by its caustic acrimony is destructive, when undiluted, and if much weakened by the addition of fluids, and taken by the mouth, is considerably divested of its power. This was supposed to be *Blackarie's* medicine, and afterwards given by *Chittick* in veal-broth, or other glutinous fluids; but although this caution was used; where the urinary passages were tender, it was found so irritating as to occasion pain, inflammation, and sometimes bloody urine. We are informed that *Adams's* Solvent is of a different kind, and some of the cases annexed to the account of it by *Mr. Perry* tend to favour the assertion; but where the composition of a medicine is unknown; its virtues can only be truly estimated by the effects it produces.

THIS appears to be the *rationale* or manner in which lime or lime-water acts upon the Gravel and Stone; as hinted at, and afterwards in a manner

ner pointed out, by that benevolent, and laborious investigator, the good and reverend *Dr. Stephen Hales*, with whose venerable name, this short narrative of the medicine in question must end.

By the experiments of *Dr. Whytt*, it appears that lime-water acquires a considerable degree of additional strength when poured on quick lime recently taken from the fire ; and that such water, especially that prepared from calcined sea-shells, acts so powerfully on the surface of the human calculus *without the addition of soap*, as to render its surface white, soft, and as it were mucilaginous ; and that it does not like *Stephens's Medicines*, make the urine putrid, and alkaline, which seems owing to the soap. The proportion of such lime, to water, may be, *one pound, to seven or eight of water*, and after they have remained together six or seven hours, the water may be poured off, and being rendered more clear by passing through double flannel, may be kept in close-corked stone bottles for use.

Dr. Whytt asserts, that when this water is mixed with urine it prevents the elementary particles of stone from concreting, and that it may be drank in the quantity of several pints every day, with great relief to those afflicted with Gravel and Stone; avoiding, during its use, all *fermented liquors* and such aliment as contains much fixed air, for the reasons already mentioned, in speaking of its manner of acting on the Stone.

THAT recumbent position of body in which the kidneys are least compressed, and the secretion of urine least impeded, will contribute most to the ease and safety of calculous patients: — Hence, lying on the side rather than the back, and with the shoulders elevated, will be eligible; as the urine, from its own gravity, will then sooner descend by the ureters into the bladder.

FROM a *Recapitulation* of the several preceding circumstances, and review of the various methods, and medicines recommended for the relief and cure of diseases incident to the *Bladder and urinary passages*, the following deductions may be made; namely, that organical diseases from

a *vitium conformationis* of the parts, are chiefly to be remedied by manual operation; that those proceeding from advanced age, may be relieved; and that others which are the consequence of *venereal reliques*, or other particular diseases, can only be cured by means directed to their several causes: Of *nephritic complaints* it may be observed, that, like the gout, they are frequently *hereditary*; and in the beginning, before the morbid cause produced its effects, might probably be prevented, by avoiding as much as possible, their exciting causes, and by the administration of such medicines as brought about an alteration in the general habit of body, so as to *counteract the hereditary, morbid cause*.

It may also be remarked, that some *Lithon-
triptics*, as *Pareira Brava*, *Uva Ursi*, &c. relieve the calculous symptoms without acting on the Stone; by diminishing the sensibility and irritability of the coats of the bladder and urinary passages; that *capital soap-lee*, *lixivium of tartar*, and others of the same quality, act by dissolving the mucus or animal glue which binds the stony particles together; that *fixed air*, with which al-

kaline, *mephitic water* is strongly impregnated, has the power to dissolve calcarious earth; and in the same manner, that iron is dissolved by the subtle, acidulous gas with which the german, chalybeate waters abound, and upon which their virtues chiefly depend; that *lime* or *lime-water* act on the calculus, by absorbing or extracting its fixed air, which renders it porous, and weakens the cohesion of its parts, so as to reduce it, like rotten stone, to a spongy state; but, as they often procure ease in a short time, it is highly probable, that they also act by diminishing the sensibility of the bladder; and lastly, that *sparry water*, by attracting to itself, from the urine, stony particles similar to its own, and considering the various foregoing circumstances in its favour, may be considered as a Remedy worthy of attention and farther trial.

S U P P L E M E N T.

Observations on the Influence of the Passions on the Body, and Mind; and Effects of Weather on the human Constitution.

IN the preceding part of this Essay, I have had frequent occasion to remark the general Influence of the Passions, and the salutary power of *Air, Diet, and Exercise*; but as I could not without tedious digressions, sufficiently expatiate on their nature and manner of acting on the body and mind; many particulars, *highly conducive to health*, were reserved for the subject of this, and the following Section; in which it will be proved, that from their impressions, very injurious or beneficial changes are produced in both; consequently, it must be evident that the *government of the Passions is highly essential to health, and therefore, properly becomes an object of medical attention.*

By the *Passions of the Mind*, is meant, those faculties with which it is endowed, and when naturally exerted, constitute the very *Elements of Life*; but when perverted, or erring in extremes, become destructive to its existence. Thus, the extravagance of *Hope* may be exalted into enthusiasm approaching to *madness*; and excessive *Fear* may sink into *despair*.

THE human body is made up of such frail materials, that they must necessarily decay, and often be put out of order. We are not only subject to pain and diseases, but to irregularities of the passions, and influence of weather; all which affect the *spirits*, *intellect*, and *memory*, so as to render the same individual different at different times, in *thinking*, *speaking*, and *acting*; as any one, not *robustly insensible*, may discover from his own feelings.

CONSIDERING its admirable structure, the number and exquisite fineness of its movements; that in a healthy state, all its parts must conspire to
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perform their proper office, and that the least failure occasions disease ; it appears astonishing, we so long possess “ *this muddy vesture of decay.*”

THE periods of human life distinguished by *Youth*, *Maturity*, and *old Age*, are not inaptly compared to the seasons of *Spring*, *Summer*, and *Winter* ; each being attended with certain peculiarities which sensibly affect the constitution.

IN *Youth* or the first period of life, the circulating force of the blood being more than equal to the resistance of its vessels ; the solids are thrust out and extended in growth. After *Maturity*, the power of the solids and fluids continues nearly equal for several years, and this period constitutes the prime or summer of life. In the last, the quantity and circulating power of blood is every day diminishing, and, at last, overcome by the increasing rigidity and resistance of the solids, which introduce *old Age*,

EVERY period has its attendant Disorders ; the first, subjects the patient to *Fluxes of Blood* from the nose or other parts, in consequence of the
distended

distended vascular system. *Glandular complaints* and eruptive fevers, as the *Small-Pox* and *Measles*, also at this time prevail.

IN the second; from a vigorous circulation and prevalence of the passions, the constitution is liable to *Pleurisies*, *Inflammation of the Lungs*, and *Consumption*; but where temperance is observed, and the vital parts are naturally sound, this may be deemed the most healthy period of human life: It relieves, or cures some diseases and is productive of few; for then *Scrophulous Complaints*, and habitual *Convulsions* have been known spontaneously to abate,

IN the last period of age, the limbs become contracted and paralytic; the sight, hearing, and intellect are impaired, from rigidity of the solids, and defect of circulation; the passions subside, and every vital principle is at last extinguished.

FROM what has preceded, it follows, that animal bodies continue to grow so long as the blood's circulating power is greater than the resistance of
its

its vessels; and when there is an exact balance between them; animal growth will be totally at a stand. As age gradually hardens the blood-vessels, they become an over-match for the force of the heart, whence they proceed; *old Age* then commences, the circulation languishes, and at last the animal dies.

PERHAPS, however, very few can properly be said to die of mere old age; for even the life of *old Parr* might probably have been still farther prolonged, had he not suddenly changed his air, and manner of living.

HERE we may observe, that by a kind of *fatal Necessity*, animal bodies are worn out and destroyed by that very cause which constitutes the principles of life, namely, the circulating power of the blood; consequently, the number of years which men may exist, will probably be in proportion to the *velocity of the Pulse*: If so, it will then follow, that such a particular state of constitution as produces the greatest degree of strength and vigour in youth, is not most likely to prolong life; but on the contrary, that those of weak solids, and delicate

delicate habits in their earlier state, grow old more slowly than others; and if the *Viscera are sound*, become for a time, more strong and healthy from the very effect of age.

THE gradual, and *mechanical change* thus produced by age, from infancy to the latest period of human life, is continually introducing *a succession of new sensations*, and consequent ideas which alter the bias; and diversify the operations of the mind; totally abolishing some passions, and putting others in their place. Thus, vanity, indiscretion, and the immoderate love of pleasure, are the unripe product of youth; whilst austerity, scrupulous caution, avarice, and a contempt of pleasure, are the surly offspring of old age.

PARTICULAR habits acquired by long custom are also found insensibly to gain great ascendancy over the most intelligent minds, and produce very extraordinary effects, to the benefit or prejudice of health; as well as the moral or immoral tendency of the passions.

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THE Body and Mind are so disposed by the Author of nature, that they cannot act separately, but are mutually affected *by the sole mediation of the Nerves*, from impressions alternately made on the one or other; so that the several passions can only produce their effects, whether good or bad, *by increasing or diminishing the influence of these sensible organs on the bodily system.*

WHEN any injury is done to the brain or nerves by external violence, intoxication, or febrile delirium; the distinct exercise of the mental faculties immediately vanish, and the whole animal machine is thrown into disorder. On the contrary, although the bodily organs remain perfect and duly perform their functions; so powerful are mental affections, that *extreme terror*, or *excessive joy* will suddenly disconcert the animal economy, and sometimes occasion *faintings, convulsions, and death.*

THIS evidently shews, that many dangerous diseases may be produced simply by impressions made on the nervous system, without any morbid

bid change of the blood, except what arises from the consequences of such external affections. It also appears, that those remedies which act by strengthening the bodily system, of which the nerves make so considerable a part, are of all others the best adapted for the cure of their diseases; but what relates to this circumstance, as well as the power of *sympathy* between the *corporeal* organs, and that *sentient principle* which puts them in motion, I have already more particularly explained in speaking of nervous Sympathy.

THE human mind is principally actuated by two passions, — Hope and Fear; — the first increases the energy of the nerves, and as it were, lifts it above itself; the other depresses and sinks it below its natural standard.

MOST of the subordinate Passions appear to be compounded of the former: Thus the passion of *Love* is made up by a combination and conflict of the whole, as Hope and Fear, Grief or Joy alternately prevail; and *Terror* is only a species of sudden Fear impressed with the extremest violence.

THOSE

THOSE malignant feelings or *Demons of the Mind*, for they deserve not the name of *Passions*, *Envy*, *Hatred*, and *Revenge* require no attention. They ought to carry with them their own punishment, and scorpion-like, sting themselves to death.

WE shall here take a short *contrasted view* of the several *dissimilar Passions*, in order to shew their powerful influence on the bodily system.

Hope, or expectation of approaching good, like a sovereign balm, diffuses gladness round the heart, and by acting gratefully on the Nerves, increases their power on all the vital parts: It promotes a free circulation of blood, as well as the several secretions depending upon it; assists appetite and digestion, gives strength and vigour to the limbs, and fortitude to the mind; it renders the countenance placid and chearful, and contributes universally to the preservation of health.

Fear, or the dread of future Evils, on the contrary, deadens the vital feeling of the Nerves, chills the blood, retards its motion, and diminishes

nishes perspiration ; it impairs appetite, depresses the spirits, and disposes the body to receive *Infection*.

Joy arises from the idea of present happiness, or of having avoided impending evil. This passion though allied to *hope*, and when moderate, like it, contributes to health, has yet been found, when sudden and excessive, to introduce a kind of torpor or palsy of the nerves ; to suspend the heart's motion, and destroy the patient by fainting or *mortal syncope*. *Livius* the historian informs us, when *Hannibal* overcame the *Romans* at the battle of *Cannæ*, where fifty thousand men were left dead in the field ; that two women instantly *expired with excess of joy*, on seeing their sons unexpectedly return, who were said to be among the slain.

Sophocles being pronounced victor among the tragic, Grecian poets, was himself overcome by a tumult of joy, and forfeited his life to glory. Such also was the fate of the *Spartan Father* who died embracing his son when crowned with conquest at the olympic games.

Sorrow

Sorrow implies some present calamity oppressive to the *Mind*: It is attended with universal languor, loss of appetite and sleep; giddiness of the head, involuntary effusion of tears, and fainting; and by diminishing nervous influence, it suspends the natural secretions. The pulse loses its usual strength, and respiration becomes so laborious, that the patient frequently sighs to relieve himself from an oppressive load at the breast.

Terror is a species of extreme and sudden fear, from the apprehension of instant danger. It acts upon the nervous system with the velocity of electric fire, and so much increases their influence on the body, as sometimes to give it an incredible degree of strength and agility; but when this momentary exertion is over, universal languor succeeds: During the surprise, the vessels are strongly contracted, and their blood impelled with such violence, that recent wounds have been forced open and bled afresh; but at other times a contrary effect is produced; where a kind of *apoplectic torpor*, presently destroys the person affected; as in the case of the woman who on seeing

the oar drop from *Lunardi's Balloon*, and supposing it to be himself, was struck with such terror, that she *instantly expired*.

So vast is the concussion given to the body, on such occasions, as to alter the fluids, and change the disposition of their strainers, to destroy the balsamic quality of milk in nurses; and in others to *turn the Hair grey*; an instance of which happened not long ago at *Hatfield Peveril* in *Essex*, in a boy who narrowly escaped being drowned.

AN ague, palsy, and fits of gout have sometimes been banished from the like cause; and the sudden out-cry of fire in the dead of night, has been known, for a time, to restore sight, or even the limbs of those lame and bed-ridden for many years. However strange it may appear, history informs us, that the son of *Cræsus*, who before had been *dumb*, when he saw the king his father about to be slain in battle by an uplifted sword, cried out with vehemence, *Soldier, hold thy hand, thou kill'st the king!*

THESE are the formidable effects of *terror*, and if there are instances of its curing some diseases, many more might be mentioned to shew its fatal power, by producing *apoplexy*, *convulsions*, and *death*.

Anger, or a sense of injury sustained, produces effects similar to *terror*. When it is attended with *revenge*, the heart palpitates, the hand trembles, the eyes flash with rage, and the countenance alternately becomes red and pale. Nothing however is more false and inconsistent with the philosophy of the Passions than the general opinion that *paleness* always indicates *revenge*, for it is as frequently occasioned by *fear*, *excessive joy*, or *exquisite sensibility*; and it would be easy to prove that the same cause which creates paleness of the face, at one time, might in the very same individual, occasion it to become florid at another, according to the degree of strength or weakness then prevailing in the body.

Anger has been observed to occasion profusion of bile with *sickness*, *vomitings* and pain in the bowels. In those of plethoric constitutions, it

has produced *apoplexy* and *death*, as in the case of Lady H——ton, and sometimes *delirium* or *madness*; but on the contrary, such as were of a cold, phlegmatic temperament and subject to *melancholy*, *dropsy*, or *intermittent fevers*, have been relieved by its effects.

THE passion of *Love*, of all others, is most difficult to be defined; so various are its affections and invincible is its power, according to age, sex and temperament; or as it is attended by hope, and fear, grief or joy. Many instances have occurred, where those affected by this bewitching passion, have become *epileptic*, or fell into a *nervous fever*, *consumption* or *melancholy*; and I have known some instances where these diseases, thus introduced, became *mortal* in the conclusion.

If such are the injuries brought upon the constitution by irregularity and excess of the Passions; how much should it be the care of rational beings to guard against their insults, and oppose their pernicious influence with virtuous and becoming resolution?

Happiness

Happiness and *Misery* are the lights and shades which fill up the out-lines in the *portrait* of human life. Every man naturally endeavours to attain one, and avoid the other, but by different means, and often disproportioned to that end. We frequently deceive ourselves in the pursuit and enjoyment of our wishes. Extravagance of hope often ends in disappointment, and even a series of pleasurable events, at last lose their power. To give them true relish, and make them lasting, the mind must refer to some former, painful sensation.

A person who always possessed health, is scarcely sensible of its value; but when lost, let it again return, and he will bless the means which restored it. None enjoy riches so much as those who have been at great pains to attain them, and tasted the bitterness of want. He who was always affluent, has no competent idea of former indigence, to contrast such a state, and exalt his present enjoyment.

WERE our pleasures too exquisite and lasting, they would wear out the body before its due time: *Permanent pleasure can only exist in the mind.* Every extreme therefore, happily corrects itself, and every evil works its own cure.

IF the violent passions of the mind, harrow up the soul, disturb its union with the body, and injure health; a conscience pure, and uncorrupted,—the inestimable reward of virtue, will best reconcile them to each other and cause them to act in harmony: That will speak peace to the mind, whatever the world may say, and shield it from the malignant effects of slander and unmerited abuse.

WHOEVER is too solicitous about censure, fame or the possession of temporal enjoyments, will seldom find repose: An ungracious look from his superiors, or unmerited insolence from those below him will vex and discompose him. If he is ambitious, he must often feel the bitterness of disappointment; if anxious for long life; a coffin or shroud, the apparatus of Death, will alarm and appal his senses; while he who beholds those mor-
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tal calamities with a philosophic eye ; who is neither weary of living, or afraid to die, will find in himself inexpressible calm and repose.

THAT man, only, can be truly rich, who is most truly happy ; and he is most likely to become so, who *enjoys health and a good conscience*, and with a virtuous resignation is prepared for the unavoidable evils which flesh is heir to ; who expostulates with the folly and extravagance of his own desires, and although a hard task, at last convinces himself that *what he likes best, is not always best for him* ; who, at all times, preserves a decent equality of mind ; is not arrogantly elated with the delusive smiles of *Prosperity*, nor fervilely cast down by *Misfortune* which, by prudence and piety, may often be converted into real benefit.

IN a word, the *Government of the Passions* is as essential towards preventing diseases of the mind, as *Temperance* contributes to hinder them from invading the body.

THE different seasons of *Spring*, *Summer*, and *Winter*, have also a manifest influence on the body and mind. In Spring, animal, as well as vegetable bodies experience a kind of refuscitation; the nerves are invigorated, and irradiated with pleasurable feelings; but when the autumnal leaves, like false friends, begin to fall off by the winter's cold; they are overshadowed by melancholy gloom and all their delectable sensations are chilled and reversed. The celebrated poet *Milton* was a remarkable instance of the truth of this assertion; for, we are told, his fancy made the most elevated flights in the Spring. His imagination in several parts of his *Il Penseroso*, *L'Allegro*, and *Mask of Comus*, are fraught with the divine spirit of poetry; whilst at other times he scarcely comes up to cold mediocrity.

It will not here be requisite to call in the assistance of *Physic* or *Philosophy*, to prove the effects which different climates and alterations of weather have on human bodies, especially those which are infirm. The great difference experienced

ced by our feelings, from the sudden changes of the atmosphere, even in the space of a single day, or hour, will more powerfully confirm the reality of such effects than all the reasoning in the world,

Popular Diseases, as well as bodily habit, and natural temperament in people of different places and nations, chiefly depend on particular situations, viz. the soil, air and water peculiar to each.

WE know that transplantation changes the shape and quality of some *vegetables*, and that certain *animals* lose their native temper when transported to other countries. The phlegmatic disposition of a *Dutchman*, or half-frozen, insensible constitution of a *Laplander* might be thawed, and mellowed down into more pleasurable feelings, by the warm, delightful climates of *Italy* or south of *France*. Influenced and animated by the air, and manner of living prevailing among the natives, he would, like them, delight in mirth, in music and society; and from the same cause, an Englishman, at Paris, would perhaps be more than equal in vivacity to a Frenchman in London.

Men

Men would not therefore perty presume on the superior excellence of their bodily, or mental faculties, did they consider how accidentally they came by them.

VERY considerable changes on animal bodies are likewise produced from the mediation of the atmosphere, by the *Sun* and *Moon*, according to Dr. *Mead*, who has professedly treated on their influence. *Sir Isaac Newton* has clearly demonstrated, that by the united, and separate force of the *Sun* and *Moon* all the varieties of the tides may be accounted for. The waters of the ocean, and air of our earth are fluids subject, in degree, to the same laws of motion; and if the sea is agitated by the influence of those planets, so likewise will that ocean of air surrounding the earth be elevated to a considerable height by their attraction; especially, when they arrive at its *meridian*.

AGREEABLE to this observation, *Seamen*, *Shepherds*, and those whose interest is connected with changes of weather, and constantly reside in the open air, observe, there is generally a breeze of
wind

wind about *Mid-day* and *Mid-night*, although the atmosphere before that time had been still and calm : By this ebbing and flowing of the sea, and air ; winds and tides are produced, which agitate and preserve those fluids in their original purity, without which we could not exist.

THE changes of air at *New* and *Full Moon*, especially a little before the *Vernal*, or after *Autumnal Equinoxes* have considerable influence on health. At this time, storms and tempests generally prevail; the air is rendered too light, and being insufficient to blow up the lungs, the mass of blood cannot pass freely through them ; hence difficulty of breathing, and palpitation of the heart, attended with sleepiness and oppression.

BESIDES this cause of variation in the constitution, there is another equally prevalent, *viz.* a considerable quantity of air is contained in our blood, which is expanded by *Heat*, and condensed by *Cold*. This air will always preserve an equal balance with that pressing on the surface of our bodies. In summer the veins are large and tumid, in winter small and contracted ; and this can only
happen

happen by the contained air in the blood, taking up a larger, or smaller space, according to the degree of heat existing in the body ; for, the quantity of blood, at both seasons, is precisely the same.

FARTHER to illustrate this matter from bodily feeling ; let those of weak habits, and great nervous sensibility, recollect how they have been affected before a thunder-storm, independent of fear, when the *Air* is rarefied and rendered preternaturally light, to an uncommon degree ; and how immediately they find relief by the sudden deluge of rain falling soon after, which, by cooling and condensing the air, gives it sufficient weight to counteract and repress the expansion of internal air, as well as more effectually to blow up the lungs.

IN this conflict of the atmosphere, when the air is overheated, they are not only half suffocated, like fishes out of water, and brought from a heavy, into a lighter element ; but are sometimes seized with head-aches, vomitings, or bleeding at the nose, and universal tremor, from the sudden
expansion

expansion of air in the blood, and the uncommon stress then laid on the vascular and nervous system.

THUS, animals die in the exhausted receiver of the air-pump, for two reasons; first, because they cannot exist when deprived of air, the motion of their lungs being then shut up; next, because the blood-vessels will be torn asunder by the expansion of the included air, when the counter-pressure of the surrounding air is taken away. In consequence of the same cause, a withered apple placed in the exhausted receiver, becomes plump and fresh like one just plucked from the tree.

IN warm, damp weather, before rain, when mercury in the barometer falls; those of infirm constitutions perceive an unpleasurable sensation; the body is indolent, and the mental faculties less acute. The flesh is then perceived to bloat and swell; they have aches and pains in different parts, pinchings in the bowels, and sometimes a diarrhoea. They complain that the weather is dull and *air heavy*; whereas it is just the contrary; for, the external air having now lost its *natural gravity*;
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the consequent rarefaction of the air in the blood, will produce a sense of weight and oppression in the body ; so that we fall into an *error*, by applying that to the air, which is only the result of our own feelings. Before a fall of rain, when the atmosphere is damp and almost deprived of *electric fire* ; the body is listless and inactive, and the skin contiguous to old sores which had been healed, becomes livid, from a stagnation of blood in the cutaneous vessels.

THE *malignant effects of the Syrocc wind are not confined to Naples*, but also prevail here, though in a less degree, when it blows from the same quarter, — the south-east ; for, then the atmosphere is almost totally deprived of its fire or ethereal spirit, as appears by the *electric machine* which can only be made to collect a very small quantity : At such times the *nerves* seem to lose their influence upon the body, which is affected with universal debility ; pain in the limbs, and great dejection of spirits, all which presently vanish, when the wind shifts to an opposite quarter.

IN such cases, where the circulation is deadened, and perspiration obstructed; the preceding circumstances will manifestly point out the use of warm clothing, the flesh-brush, exercise, and every thing which may *invigorate the torpid nerves, and promote a free circulation*; of which, the moderate use of generous wine, peruvian bark, with acids, and a tepid, salt bath, are the principal.

FROM what has been said, it follows, that when the natural balance between the circumambient air and that contained in the animal body is destroyed, many temporary changes must happen, according to various alterations of weather, the moisture and driness of the atmosphere, and its degrees of heat and cold; all which will create unpleasurable sensations hardly to be described.

WHEN the weather is intensely cold, the weight of external air pressing on the bodily surface may compress and overpower that within; and so much repel blood to the *heart* and *brain*, as to occasion sleepiness, stupor, apoplexy, and death: These symptoms have frequently been observed in climates

mates uncommonly severe; and more particularly where the elastic, internal air is increased and set at liberty by a dissolved, scorbutic habit. The reason why most people sleep better in the country, seems chiefly owing to the freshness and greater gravity of the air acting more forcibly on the surface of the body.

THE air on the tops of very high mountains being too light, and insufficient to blow up the lungs, occasions difficulty of breathing and sometimes the bursting of blood-vessels in the weaker *viscera*; especially when violent efforts of body in gaining those vast heights are superadded. This ought to be a caution to such, who in the eager pursuit of pleasure and fine prospects, might, otherwise, be forgetful of their own safety.

MANY instances might here be brought to shew the remarkable effects of *lunar Influence* in diseases of the brain and nerves. *Epileptic Fits* most frequently occur at *New and Full Moon*; and madmen are then more violently affected with frantic ravings.

Periodical

Periodical head-aches, as well as *fluxes of blood* from the nose, lungs, or weaker *viscera*, also happen more frequently at this time than any other, especially about the *equinoxes*, when the influence of this planet is considerably increased; or where other accidental causes concur; as the violence of passion, summer heats, the use of mercury, or immoderate exercise; all which lay an additional stress on the blood-vessels. Hence also *Apoplexy*, or other violent diseases, which might have been prevented by *bleeding*, *evacuations*, and *sparc diet*.

Dr. Mead mentions several patients, in whom the epileptic fit returned regularly at *new and full Moon*; particularly, in a girl, which afterwards kept its periods regularly with the *Tides*. *Dr. Pitcairn* also speaks of a violent convulsion of the arm returning periodically twice a year, *viz.* in *March and September* at *full Moon*, near the vernal and autumnal equinoxes.

THE *Equinoxes* are particularly unfavorable to the unhealthy and consumptive: At this time, according to *Sanctorius*, the vital powers of the

body are uncommonly languid, and all its natural discharges suspended, especially that of *perspiration*. Irregularities of the passions, errors in diet, or other causes then concurring have therefore been observed to produce dangerous diseases.

IN the months of *March* and *October* a greater degree of mortality has been observed to prevail, than at any other period during the year; and the principal reason of this seems owing to sudden changes of weather at those seasons. Weak solids cannot then, without violence and pain, accommodate themselves to the quick transition in the temperament of air, from one extreme to another.

AT all times, when the atmosphere is moist and light, or abounds with noxious vapours; it will be proper to avoid the morning and evening air; the first is cold, and unfriendly; the last replete with damps and falling dews which in particular mineral soils, or near stagnating, putrid waters, are loaded with baneful qualities. At such times it will be eligible for the weak and valetudinary to retire from low situations, to those more dry and elevated,
which

which are fanned by fresh breezes, and to use exercise which will give strength and vigour to the constitution.

CHANGES of air, as to its *gravity* and *lightness*, or the degrees of *heat* and *cold*, *moisture* and *dri-ness*, may all be known from those elegant and useful instrument the *Barometer*, *Thermometer*, and *Hygrometer*, from which many useful indications may be taken, relative to the preservation of health.

OTHER planets of the first magnitude, as well as the *Sun* and *Moon*, influence the human system; not in any supernatural or incomprehensible manner, but solely by the *mediation of our atmosphere*, conformable to the stated and universal law of nature; for, the celebrated *F. Hoffman*, who regularly kept a *Journal of the Weather* for ten years, and whose integrity was equal to his medical knowledge, solemnly affirms, that great and remarkable *meteorological changes* were brought about by appearance of the larger planets.

*Observations on the salutary Power of Air, Diet,
and Exercise, in the Prevention, and Cure of
chronic Diseases.*

THE *Regimen of Diet*, and benefit of pure *Air*, and moderate *Exercise*, in diseases of the *Viscera*, make so necessary a part of the curative intention, that it is presumed, the following *Rules* and *Cautions*, with such particulars as explain their nature and qualities and the manner of their acting on the human body, may add to the utility of this Essay.

THE propriety and efficacy of Regimen, in maladies of the *chronic kind*, is apparent; for, as they are not attended with immediate danger, like acute diseases; there is sufficient time and opportunity for the choice of such Air and Aliment as best accord with the nature of the disease and particular constitution of the patient, inasmuch, that the universal benefit of *pure Air*, and *moderate Exercise*, assisted with mild and simple medicines, if duly attended to, would often produce
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in the habit, a gradual, salutary, and lasting change; attended with a circumstance which cannot fail to recommend them, *viz.* they may be beneficial to all, and can be hurtful to none.

As it is universally allowed that the *Air* of certain places has a pernicious effect on human bodies; so, on the contrary, it cannot be doubted but that which is temperate, and pure must contribute to the preservation, or recovery of health: Diseases called *endemic* or those peculiar to certain places, as *agues*, *dropfies*, &c. and, on the contrary, healthy situations beneficial to animal life, both demonstrably shew, how much *Health* may be affected, for the better or worse, by causes always present to the body, and insensibly acting on the constitution.

SUCH diseases principally depend upon preceding circumstances; but human bodies being also affected by intemperance, and the passions of the mind; those *acute distempers* called *epidemic* which sometimes rage, for a time, with uncommon violence, among brute animals living in the open fields, and in a state of nature, are more evident

proofs of its powerful and malignant influence. The first shews that the atmosphere of particular places, is at all times more or less unwholesome; the last, that the atmosphere in general, may become so for a time, from variety of morbid causes, which notwithstanding, are sometimes so obscure, that they would be scarcely known to exist were it not for their effects, as those of the *plague, influenza, &c.*

Pure air is more essential to life, even than food itself; for, animals will subsist without nourishment for a considerable time, but when deprived of air, they perish in a few moments: Neither animals nor vegetables can exist without *Air and Water*; but neither pure Air, or pure Water *alone*, are sufficient for vigorous growth of the last; for, even soft, river-water, will not answer that purpose, in a manner equal to refreshing rain which has been experimentally found to contain that vivifying principle, so essential to the support of vegetables, by philosophers called *Phlogiston* which not being universally known, and often imperfectly understood, it is necessary to explain. *Phlogiston* is that combustible matter contained

tained in the atmosphere, which being collected takes fire in the clouds, in flashes of lightning, and is supposed to be the same principle as that of *electric fire itself*. — This inflammable vapour is also discharged from the lungs of animal bodies, from burning candles, and from liquors in a state of fermentation. *Thames* water closely confined, after agitation on ship-board, has by means of this inflammable principle, been known to take fire, on opening the cask at the bung.

It is not necessary to enter into a minute disquisition of all the properties of air: Its lightness, and gravity; its compressibility, and power to expand, have all been accurately described by natural philosophers, and satisfactorily demonstrated on the *Air-pump* and *Barometer*.

AIR is necessary to the existence of all animals; for, it is not only constantly taken into their lungs by respiration, and largely mixed with the food, so as to make a part of the animal system, but is also constantly pressing on the surface of their bo-

dies with different degrees of gravity : It therefore, can be no wonder that the human constitution should be so variously affected by it.

THE atmospheric Air we breathe, till of late was supposed to be a *simple element* ; but philosophic investigation demonstrates, that instead of being pure, this fluid, in any given quantity, consists of scarcely *two parts of pure, dephlogisticated Air*, one which is impure, or as it is called by the chemists, *phlogisticated air*, and about a *fourth part of fixed air* : Pure or dephlogisticated air has nearly eight times the power of common air, either in sustaining life, by respiration, or supporting flame ; for, without it, animals instantly die, and flame is extinguished in a moment,

AFTER common Air has been taken into the lungs in this state, and then breathed out or expired ; on examination, it has been found, that the *gross, impure Air remained unaltered* ; *the pure air was diminished in quantity* ; and *the fixed air increased*,

THE proportion of these several kinds of Air being different in different places, according to the nature of soil, water and situation; the reason becomes obvious, why the health of the human body is so variously affected by them; and why some diseases are *endemic* or peculiar to certain places.

THE florid colour of pulmonary blood or that which has circulated through the lungs, is owing to its having been impregnated by the *pure Air*; for, when respiration is laborious, or obstructed, as in *Asthmatics*, this florid colour of pulmonary blood becomes more faint and *pale*: On the contrary, when the action of the lungs is uninterrupted, and we breathe a more pure, dephlogisticated, country air; the whole mass of blood becomes perceptibly *more florid*, and imparts to the countenance, a more *fresh* and ruddy appearance.

FLORID blood becomes black, when exposed to *mephitic* or unwholesome air, but is again restored to its colour, when mixed with pure, *phlogistic Air*, which it manifestly absorbs; because,

cause, the last has been found considerably diminished in quantity after remaining long in contact with it.

By *pure Air*, then, can only properly be meant, that which is most free from the noxious *effluvia* of metals, and corrupted steams of vegetable, or animal bodies; and that which is neither too hot, moist, or dry, may be called *temperate air*.

THE atmosphere, therefore, of our earth consists of *pure air*, *phlogistic air*, and *aërial acid*, and the combination of these constitutes the common air we breathe; which, as already observed, becomes unwholesome by frequent respiration, the combustion of fuel, or *effluvia* of putrid bodies, so as to be rendered highly noxious: Perhaps the *longevity* of the first inhabitants of this earth, might therefore be accounted for, by their breathing a purer atmosphere than we do at present; considering the vast degree of its contamination, for so many thousand years, by burning volcanos, putrid animals, and other causes.

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THAT these various causes might not totally extinguish and destroy that vital principle of the Air so necessary for the support of animal life; providence seems to have appointed a happy expedient, *viz.* the agitation of the Sea, and growth of Vegetables; for, as it has been experimentally proved, that *mephitic vapour largely combines with water when agitated*; and that the *perspirable matter of growing vegetables corrects putrid air*; there is great reason to conclude, that the ocean, like an immense vortex, envelopes or swallows up the putrid air, and that this great and salutary design of nature is also considerably assisted by the *antiseptic effluvia* of vegetable bodies.

THE atmosphere, by the effects of heat and cold, is alternately expanded and condensed, so as to keep it in continual agitation, by which, its purity is also providentially preserved. Hence the great unwholesomeness of sudden calms, and heavy rains, after long droughts, as those called *Monsoons*; likewise of a sudden thaw after severe frosts;
for,

for, then, colds, fore throats, fluxes of the belly, and diseases of the putrid kind are known to prevail with uncommon violence.

THE *effluvia* proceeding from pure, virgin earth fresh turned up has been found extremely refreshing to those of weak lungs and consumptive habits; and on the contrary, mineral exhalations have been observed to blight the contiguous grass and vegetables, and consequently must be highly noxious to animal bodies.

Of all metallic substances, that we know, *Iron* seems the least injurious to *vegetables* and *animals*; for, it enters largely into the composition of the first, and the last contain a small quantity of it, as appears by the attraction of the load-stone, when applied to their ashes.

AIR is always found to partake of the nature of the neighbouring soil and water, and is therefore more or less healthy according to the situation of particular places. The qualities of *Dew* which is only water impregnated with such *animal, mineral, or vegetable* substances as arise in vapour

vapour from the earth, afford the best means of ascertaining the *local purity of air, and water*; joined to the *customary longevity* of the inhabitants of such places, as live temperately.

THIS is a circumstance of the utmost importance to those who propose to raise buildings where they mean to reside, which however magnificent, will afford little enjoyment to the possessor, if health the principal source of happiness, does not there fix its abode.

ELEVATED situations in chalky, or gravelly soils, open to the north winds, and near the rocky banks of pure, running streams, however severe the air may be, are by far the most healthy in Autumn or the heat of Summer. Inhabitants of high lands are observed to be more alert and strong, than those residing in valleys or low grounds where the air is moist and mild: In the first, it braces and invigorates the body; in the last, relaxes and deadens its vital power.

FOR the same reason, heaths, and open commons overspread with sweet-smelling shrubs, where the air is fresh, dry, and as it were *medicated*, are generally found to be healthy : but near woods and inclosures, where it is damp and confined; *complaints of the bowels, rheumatisms, agues, and dropsies frequently prevail.*

RICH soils lying low, and contiguous to the marshy banks of lakes or large rivers, exposed to the sun's heat, or south-west winds, are in the highest degree noxious ; the air of such places being damp and loaded with the corrupted steams of animal and vegetable bodies, which there rot; and are dissipated in putrid vapour.

SUCH situations will dispose the body, to a lax, bloated, scorbutic habit ; to nervous disorders, agues, a dropfy, consumption, fluxes, and putrid fevers. As *milk* is soon turned sour, and vegetable infusions presently become stale and musty, in a warm, impure air ; so the animal fluids may be corrupted from the like cause.

THUS

THUS Air replete with the stench of dead whales, swarms of locusts, or human bodies remaining long unburied on the field of battle, have been known to produce *Pestilence*; - all which shew the necessity of excluding *burial-grounds* from great cities, where the dead would become offensive to the living. Overflowing of the *Nile*, succeeded by hot weather and southerly winds, generally brings the *Plague*. The air of *Rome*, *Piso*, and *Amsterdam* is extremely unhealthy at particular seasons; and sickness, or health among the inhabitants of *Egypt* keep regular periods with the winds.

EVERY animal is surrounded by its own atmosphere, consequently, the cleaner such bodies are kept, more pure and wholesome will be that air taken into their lungs by respiration, a circumstance of greater importance to health than is generally imagined; for, *putrid fevers and jail distempers* equal in malignity with the plague itself, are chiefly occasioned by nastiness, marsh vapour, or corrupted air.

Platnerus

Platnerus wrote an incomparable treatise on diseases proceeding from want of cleanliness; and I would wish it to be remarked, that nothing ought to be considered as trifling that has the least tendency to preserve health.

Air has a dissolving power upon *Water*, which is considerably increased by *heat*; and this is the reason why south or western breezes, which blow over those immense tracts of water, the *Mediterranean* and *Atlantic Oceans*, are replete with moisture; and consequently relax and weaken the body.

MOISTURE or *Water*, thus combined with warm *Air* is rendered visible, when condensed into drops on the surface of bedchamber windows, by the sudden accession of external cold; and fogs are nothing but water decomposed or separated from the air which dissolved it.

SOME liquors can only be *brewed* to perfection in particular places, which local peculiarity equally contributes to the production of bright and
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vivid colours, in the art of *dying*; and even the *high temper of Steel* derives much of its excellence from the qualities of *Air* and *Water* in certain places.

It is not less extraordinary, that liquors in a state of fermentation, are immediately turned sour, by the vast *rarefaction* and expansion of the air; or, as some suppose, by the sulphureous *effluvia* with which the air is impregnated by *lightning*; and if such are the effects of air on fluids in general, we need not wonder that, by altering the blood and juices, they should become the *cause*, or *cure of diseases*.

As *vegetables* cannot grow without air; so neither can *fermentation* go on, or that process in kindling up the sparks of *animal life in hatching eggs* be completed without it. Living creatures cannot long survive, or *flame* subsist, without a constant supply of fresh air, which therefore may properly be said to contain an *enlivening spirit*.

If, for instance, a lighted taper be put under a bell-glass so closely fixed as totally to exclude the outward air, the flame will continue a longer or

shorter time, in proportion to the quantity and purity of air contained; and it may be observed gradually to burn more languidly as the pure, dephlogisticated air is exhausted; till at last the flame is totally extinguished, although the taper is not burnt out.

Just so this *Element* contributes to feed the *lamp of life*; and when its natural qualities are destroyed by the breath and perspirable matter exhaling from animal bodies, it becomes highly pernicious, and destructive to health. Hence may be seen the necessity of avoiding warm, moist, confined air; the great advantage of sleeping in lofty, open, bed-chambers, daily ventilated by fresh breezes, and of chusing elevated, dry situations for the place of constant residence.

By *Diet* is meant that *aliment* taken into the stomach for nourishment, which being digested and rendered *chylous*, at last enters into the composition of flesh and blood: Hence many changes from sickness to health, may gradually be brought about

about by *food of different qualities*, which could not be so easily effected from *medicinal substances*; for, the first is continually received into the body in large quantities, and constitutes the very elements of its existence, but the last are only given by grains, and scruples, for weeks or days.

SUCH a salutary change may rather be expected, because, many substances are found to retain their natural qualities, in a considerable degree, after being digested and transmitted into the blood. Thus *turpentine* and *asparagus* will affect the smell of urine; *madder-root* constantly taken with food will *tinge the bones red*; and *meadow garlic*, or *elder-leaves*, on which cattle have accidentally fed, will communicate to their milk, a strong, disagreeable flavour.

BOTH *animal*, and *vegetable bodies* originate from slender beginnings: The bulk superadded to the body of an infant, till it advances to the ultimate period of growth, is all derived from the aliment which gives it nourishment; and the *acorn* unfolds its stamina, and gradually becomes an *oak* by the accession of juices borrowed from the earth.

IN what manner *aliment* becomes *chyle*, how it is ripened into blood, and converted into bodily substance, has been fully shewn in treating on *digestion and nutrition*; but how nutritious matter, which before was senseless and inert, at last becomes transubstantiated, and endowed with *intellectual feeling* in the brain and nervous substance; how that feeling is so diversified in different senses of the body, as by means of the same organ, differently modified, *viz.* the *nerves*, to see in the *eye*, hear in the *ear*, and taste in the *tongue*, is rather matter of astonishment than investigation.

Pythagoras, in the cure of diseases, preferred vegetable diet to the use of medicines; and determined the choice of its nature and quantity by the nicest rules of temperance. *Asclepiades*, the famous Bythynian physician also founded his practice on diet, and exercise; and we find that *dietetic* and *gymnastic* institutions so much prevailed among the antients, that they cured many diseases, of the *chronic kind*, with little assistance from medicine.

THE *Regimen of Diet*, should not only be adapted to particular ages and constitutions, but also to the nature of climate, and degree of the patient's exercise. When the quantity of food is too great, the vessels will be overloaded, and the body oppressed; if too small, it will waste and decline.

EXCESS impairs the distinct exercise of the reasoning faculties, and renders the perceptions of the mind dull and unfit for study or deep meditation. In a word, *whatever destroys the true balance between the solids and fluids will produce sickness and diseases*; so that either too high or low living may injure health, but of these extremes, the first is infinitely most common, and productive of danger; since the several instances of *longevity* are chiefly to be found among those who live on *spare and simple diet*. On the other hand, men who are intemperate, and fill their vessels to the extreme of bursting, frequently die before their natural time, of *apoplexies* or other violent diseases.

The good effects of temperance are acknowledged by all, but duly regarded by few.

HE who means to be a *rational Epicure*, and to exalt the pleasure of eating beyond the reach of a sensualist, should eat with *simplicity* and *moderation*, for, then only, he *will taste with his natural appetite*. If rich sauces, and high-seasoned dishes are grateful to some, they possess not the genuine palate of nature, but one which is depraved; for, children and young people disrelish all such aliment, and never grow fond of it, till their taste is vitiated by habit and bad example.

WHEN the food and palate are both in their natural state, the relish is high, and the body duly nourished; but when by the arts of compound cookery, the first is deprived of its soft, balmy quality, and rendered almost *caustic* by salt, cayenne pepper, and other high seasoning, it stimulates the languid appetite, turns round the wheels of life too rapidly, and wears out the body before its time. Whereas, those who abstain from much wine, spirituous liquors, or hot, spicy aliment, acquire

acquire an exquisite degree of delicacy in the sense of tasting, and in general are much longer lived.

IF the qualities and taste which things naturally possess are right; those communicated to them by the too officious hand of art, must surely be wrong. The cool, refreshing *melon*, a native of scorching climates, intended to quench thirst and allay heat, is often robbed of its genuine properties by a profusion of pepper; and *acid fruits* which would strengthen the stomach and resist autumnal putrefaction, are lost in the taste of sugar.

THUS the beneficent simplicity of nature is superseded by customs which luxury has introduced; and it must be confessed, with regret, that in the affairs of human life, many are rather guided by the example of others, than by reason, or their own understanding; and, indeed, there is nothing so ludicrously absurd, that will not derive sanction from custom, and the prevailing fashion of the times.

IN fixing a standard for *temperance*, our own feelings, or even the custom of the place, would be insufficient guides: We should rather observe, in what degree of vigour and perfection animal life is supported among such as live on the most simple fare, and in a manner conformable to nature.

IF many of the *Irish*, with *milk* and *potatoes*, enjoy perfect health, and exercise all the faculties of body and mind; if the *Persians*, who were a brave and warlike people, subsisted chiefly on *bread* and *cresses*; and whole nations, who seldom eat flesh, but only *rice* and *fruits*, live long and healthy; we might in this country, subtract largely from our *full, animal diet*, and with great advantages to the constitution. When imaginary wants are discarded, real ones will soon be supplied. We should endeavour to distinguish the instinctive calls of Nature, from the artificial cravings of a depraved appetite. A whimsical palate is a troublesome companion, and makes much larger demands than is its due. If the stomach refuses natural food, it ought to do penance and be starved into compliance.

GENERAL

GENERAL Rules, however, respecting *Diet* must always have their particular exceptions, according to the different constitutions for which they are directed. *Vegetable food* is less nourishing and more flatulent than that of the *animal kind*; but it resists putrefaction, is most proper for those of strong, *bilious habits*, and only requires pure water for beverage; but on the contrary, fermented liquors will be necessary for such as are accustomed to the plentiful use of *animal diet*.

How far the constitution may be changed by vegetable diet, is evident to those who have been cured of *inveterate scurvies* by the plentiful use of *fresh vegetables*, and *pure water*; and instances are not wanting, where even the irascible passions have been, in a great measure, subdued by the same means,

Aretæus mentions the cure of a *leprosy*, by total abstinence from animal food, and the constant use of vegetables, in those afflicted with that loathsome disease, who, from fear of infection, had been abandoned by society, and driven out into desert places.

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Pure water, a *simple medicine* of sovereign efficacy, is that elemental fluid designed by Nature for the nourishment of all bodies, whether *animal* or *vegetable*; it softens the food in the stomach, attemperates corrupted bile, dissolves the sharp salts and rancid oils, and washes them out of the body by the secretion of urine. How superior is this inestimable liquor, gushing from the pure bosom of a rock, as from the cellar of Nature, to all the artificial compounds which luxury, or human invention can devise.

THE feverish and sickly stomach often thirsts after a draught of the crystal spring, as the greatest cordial, while it nauseates the richest wines; and indeed, wine, beer, and all other made liquors, are only water sophisticated with different proportions of oil, salts, and sulphur, so altered by *fermentation*, as to set their spirit at liberty, which then taken into the body, produces a *narcotic effect* on the nerves, and occasions intoxication.

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I am far from supposing that those liquors can never be beneficial; and would only infer, that they are prejudicial by abuse, that they only become necessary from custom, that they ought to be used with great moderation, and rather as *cordials* than *common drinks*.

THAT water is best which is perfectly clear, insipid, light, and which will instantly incorporate and lather with soap; but clearness is not so certain a test of its purity, as lightness; for, the petrifying spring at *Knaresborough*, loaded with stony particles, is extremely limpid. *Distilled*, or *snow-water*, and that which has passed a *filtering stone*, is purest; and its lightness may be determined by the *hydrometer*.

WATER-DRINKERS, and those who chiefly live on *vegetables*, are observed to be more healthy, and long-lived than others: In such, the faculties of the body and mind are more strong; their teeth more white, their breath is more sweet, and their sight more perfect, than in those who use fermented

mented liquors, and much animal food. They are less subject to *gout*, and *gravel*, *colic*, *scurvy*, or *apoplexy*, and acute diseases in general.

QUADRUPEDS living on flesh, are fierce in their nature and the exhalation from their bodies is putrid and offensive; whereas cows, sheep, and other animals which feed on herbage, are much more gentle; their breath is sweet, and their excrement almost inodorous.

FROM what has preceded it appears, that *much animal food* is unwholesome; especially to those of *bilious habits*, in warm, moist weather; it will load the blood with *rancid oils*, spoil the sweetness of breath, render the several discharges more offensive, and dispose the body to diseases of the putrid kind; which may best be prevented, or cured by vegetable, acescent diet, a total abstinence from fermented liquors, and the liberal use of *pure water*, with *vegetable acids*.

Sugar is not so pernicious as some have imagined. It may be obtained from *vegetable juices*, as well as *animal fluids*: It abounds in the sap of
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the *maple and birch tree*, in the *skirret, red beet-root*, and other plants; and fresh new-milk whey, in summer, affords a considerable quantity.

Vinegar, in many cases, is a sovereign, *simple medicine*, but being cheap, and at every one's service, it is often disregarded, to make way for things of higher price, and inferior efficacy. Moderately taken, it assists digestion, cures headache, strengthens the nerves, and powerfully resists putrefaction.

MUCH *salt* taken with food is extremely hurtful; for, it communicates to the blood a *muriatic* or *briny acrimony*, destroys the taste, hardens the fibres, produces scurvy, and hastens old age. Plentiful dilution with soft, pure water, is an effectual remedy for such complaints. — Salt, however, in moderation, has been experimentally found to promote, and not to retard the solution of animal substances.

A fresh supply of solid food, before the last meal is perfectly digested and turned into blood, is highly pernicious; but as I have remarked the
injuries

injuries arising from *long fasting*, a glass of spring-water, or cup of Tea, may be proper to dissolve, and assist the stomach in getting rid of its remains.

IF the patient after eating is oppressed at stomach, sleepy, and affected with internal throbbing, or flushings in the face; in a word, if the body and mind are much less vigorous and fit for action than before, he has then exceeded the proper quantity of food. How far the qualities of food are of consequence to health, may be evidently seen in the most striking of all human calamities, a *famine*, which is often followed by the *plague*, from the extreme scarcity of wholesome aliment.

EARLY rising, particularly in summer, contributes greatly to health, pleasure, and convenience; for, in the morning, the body is more active, and the faculties of the mind more distinct and clear. We might here add, that going soon to bed has likewise its peculiar advantages, notwithstanding the joys of twelve o'clock; even plants themselves experience a kind of unconscious repose;

repose; which did not escape the attention of that *immortal Poet*, who was familiar with all Nature, and saw the “winking mary-buds begin to open their golden eyes” at the glorious Sun’s approach.

By *Exercise* is meant that general voluntary action of the muscles which puts the body in motion, as well as its passive agitation in a carriage, or on horseback, where it does not properly move itself, but is moved by something else: The first is always preferable to the last, where the strength is sufficient to allow it.

By the propelling force of the heart, the stream of blood is driven through its several pipes and strainers; but this great instrument of circulation, though admirably adapted for that purpose, is not sufficient to keep up the blood’s motion in the smallest order of vessels, without the contractive power of the muscles by *exercise*: In what manner it contributes to that end may be demonstrated, by the simple experiment of grasping a lancet-case or any solid body in the hand, after opening

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ing a vein, where the blood passes too slowly from the orifice ; but when the muscles are contracted, instantly spouts out in a full stream.

Herodicus, the master of *Hippocrates*, who is said to have recovered himself by the power of *Exercise*, was the inventor of the *gymnastic art*, as the means of *preserving*, or *restoring health*. If this ancient physician urged his practice to a faulty extreme, by thus attempting, too indiscriminately, to cure all diseases ; surely many of the moderns are as much to blame, in expecting to remove them without it ; particularly those of the *chronic kind*, which generally arise from weakness, or some fault in the solids to which, the power of *exercise* is immediately applied.

Exercise or bodily motion increases *animal heat* by same law of nature that the electric globe, in whirling round, collects *fire* ; hence it renders the blood more fluid, and promotes its free and equal distribution through the whole vascular system. Many diseases therefore, proceeding from weakness and a defect of circulation, may, by
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exercise, be effectually relieved; such as *nervous* and *hypochondriacal disorders*, *agues*, *dropsy*, *rheumatism*, and *palsy*.

EVERY fibre of a living body is endowed with an *obscure vibratory motion* which permanently exists throughout the whole system, even when apparently at rest; and from the exertion of *this living principle*, increased or put into additional motion by exercise, *atmospherical fire* is actually collected, in quantity proportionate to the degree of its motion, as certainly as in the *electric machine*; and it is evident, that motion, even in inanimate bodies, collects heat somewhat in the same manner; for, iron may be hammered till it becomes hot, and attrition or rubbing one body against another, will produce fire.

ALTHOUGH this may at first appear a very extraordinary position, nothing is more experimentally true; and it is farther confirmed by the *human body becoming electric*, without the mediation of any *electric substance whatever*; a very remarkable instance of *atmospherical electricity* being mentioned by *Brydone* in his entertaining *Tour through Sicily*;

viz. Professor Saussure and Mr. Falabert passing over the Alps in a thunder-storm, perceived their bodies so full of electric fire, that, to their astonishment, spontaneous flashes darted from their fingers, with a cracking noise, and with the same painful sensations as when electrified.

THE same elegant writer ingeniously proposes that *invalids* subject to the noxious influence of *damp air*, should wear a fine, dry, flannel waistcoat (an electric substance) next their skin, loosely covered with another of silk, by the friction of which a considerable degree of *electricity* will constantly be produced: That this is not a vague surmise but founded in reality, may be known from the following simple fact which I have repeatedly observed, and indeed, at first, by mere accident, *viz.* let any one wearing silk stockings, over gauze worsted ones; on taking them off at night, gently shake them, and he will generally perceive sparks discharged with a cracking noise: If it is dark, the *electric fire* may often be distinctly seen. This experiment will succeed best in *dry weather*, when the under-stockings are void of moisture which destroys their electric quality.

THE diffusion of *atmospherical fire* through the parts of matter in general, seems to have been wisely opposed by the Creator, to that universal law of *attraction*, which tends to concentrate and bring them together. Hence by alternate *attraction* and *repulsion*, the motion of the material system is uniformly supported. Without fire, water would become ice; vegetation would be destroyed, and even the blood of animals converted into a solid mass: In a word, motion is the instrument which promotes the influence of *atmospherical fire* — *the enlivening spirit and soul of nature* which pervades and actuates the whole.

FROM what has preceded, it will follow, that too much or little *atmospherical fire* thus collected in the human system may be injurious to health. Those, for example, who are young, have strong *elastic fibres*, and use *violent exercise*, in whom it too much abounds, will be in danger of sudden fluxes of blood from the nose or lungs, as well as pleurifies and other inflammatory disorders; on the contrary, where it is defective, as in those of

phlegmatic constitutions, advanced age, or inactive life; agues, dropfy, rheumatism, and a venous plethora will frequently be the consequence.

As the animal juices are accumulated by nourishment, and rest; and consumed by abstinence, and motion; it is a circumstance of the highest importance to health, to proportion those opposite qualities duly, that the natural balance may be kept up between the solids and fluids.

Moderate Exercise is a sovereign remedy either in preserving, or restoring health: It increases animal heat, invigorates the heart, and promotes a free and equal distribution of blood. It assists the secretions of *perspiration, urine, and stool*; strengthens appetite and digestion, renders the body less liable to the malignant influence of weather, or to the attack of putrid diseases; in a word, it animates every part of the human system, and likewise gives alacrity and vigour to the mind.

THE salutary power of *Exercise, and good Air*, is particularly exemplified in laborious country people,

people, who, notwithstanding their indifferent food, are generally hearty and strong. They have a much better appetite, and digestion than the *rich* and *indolent*. By increased heat consequent of *Exercise*, the oily and watery parts of their food, such as it is, will be more uniformly mixed, and worked up into a proper degree of richness, and consistence to nourish the body.

Exercise, by walking in a dry, fresh air, is remarkably beneficial to those of weak solids, and pale watery blood; for, it perceptibly increases their strength, and renders the complexion more *fresh* and *florid*: From this local alteration of the countenance, we may conclude the effect to be general; and that the blood is not only impregnated with the *enlivening spirit of the Air*, as we have already remarked; but being rendered more fluid, by an additional degree of vital heat, is capable of circulating through vessels of extreme fineness, which were impervious to it before; and upon those simple principles it may clearly be seen, why *Exercise* will be found a sovereign remedy in all *chronic diseases* proceeding from lax fibres, and a cold cause.

AN *over-lax*, or *tense* state of the solids, are productive of many diseases which may be relieved by *Diet* and *Exercise*. Abstinence, and rest relax the solids, and dissolve the blood; and pure water, with *nitre*, contributes to the same end: On the contrary, the blood of labouring people, who have strong solids, is rich, and florid; whilst that of the weak and sedentary, is pale, crude, and watery: Therefore Exercise, dry Air, peruvian bark, steel, and cold bath, will brace the fibres and enrich the blood, if not contaminated by a *scrophulous*, *venereal*, or *scorbutic taint*.

IN those indeed, of lean, dry habits, who live abstemiously, and are far advanced in years, Exercise is not so necessary, or beneficial; because it increases that rigidity of the fibres which then too much prevails, and consumes the moisture which old people, from the diminution of their blood and juices, are less able to spare.

THE frequent use of the *flesh-brush*, or friction with hot flannels impregnated with the fumes of myrrh, or gum copal, thrown on hot coals, will
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be found of much greater benefit, to those of lax solids, and a languid circulation, than is generally imagined. The patient's body and extremities should be rubbed twice or thrice a day: This species of Exercise may be looked upon as a kind of *gentle electricity* which will generate heat, strengthen the fibres, promote the circulation of blood and assist perspiration; it will prevent that *venous plenitude* or swelling of the veins so frequent in advanced age; and there is another beneficial effect, which, I think, has not been mentioned, *viz. friction of the body will constantly occasion the immediate discharge of wind from the stomach and bowels*, by consent between the skin and those parts, merely from the principle of *irritability* or that property of the animal fibre to re-act when acted upon by a gentle stimulus, and by which the contiguous parts are brought into action.

Swinging is productive of the like benefit; from the percussion of air, and the great resistance thence occasioned by bodies swiftly moving through it.

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Hence, *atmospherical fire* will be collected by such *motion*, and its quantity will be proportionate to the velocity of the body so moved; otherwise, those thus violently impelled through the cold atmosphere would be almost chilled to death; whereas, on the contrary, they find themselves warmer than before.

How different is sleep, after *exercise*, from that produced by the effects of intoxication, or a full stomach? The first is tranquil and refreshing, the last disturbed by dreams, suffocation, or nightmare; nor does adventitious heat obtained from the assistance of fire, occasion that pleasurable, and permanent glow, acquired by *bodily motion*: In short, *Exercise* is the parent of *fortitude* and *health*; but *indolence* begets *timidity* and *diseases*; for, when animal, and vegetable bodies, or even the elements of *water* and *air* remain too long at rest, they depart from their original qualities; the first tend to dissolution and decay, the last become putrid and highly noxious.

IF *intemperance* and *irregularity of the passions* wear out the body and anticipate its decay; the votary to *temperance* will probably arrive at old age, without diseases or pain: Although, by fatal necessity, he was born to die; the bond of union between the soul and body will rather be gently loosed, than forcibly torn asunder. When the principles of life are nearly exhausted, as a lamp deprived of oil, the vital flame will languish, and at last, must needs be extinguished!

WE have now endeavoured to shew the state of the body and mind, and how, by their mutual sympathy, they co-operate with each other; what condition of the body fits it for health, or tends to introduce diseases; how it is altered by the *effect of age*; subject to the internal controul of *inordinate passions*; “*Servile to all the skyey influences,*” and its operations insensibly perverted by the *prevalence of custom*, so as to render it more variable than the weather-glass, and in a perpetual state of change, from the cradle to the grave.

HUMAN life, thus furrounded and assailed by a train of unavoidable evils, may indeed, be compared to a fleeting shadow “ which never continues in one stay :” Like the unballasted bark in a troubled ocean, it becomes the sport of winds and tides, and without the aid of *Religion*, *Philosophy*, and *Reason*, is in continual danger of being swallowed up and lost !

IF such are the various affections of the body and mind, and if our manner of living changes our manner of thinking, and influences our moral conduct ; thrice happy they who have been accustomed to *early Temperance*, and the *due regulation of their Passions*, as powerful motives to virtue, and the surest means of *preserving health*, *prolonging life*, and tasting its pleasures with the dignity and refinement of rational creatures.

T H E E N D.

